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GLOBAL DATA MONITORING REPORT

July 1998

Data Assimilation
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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Bracknell. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Bracknell in time for inclusion into the appropriate analysis. The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background field). Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

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2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1-2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Bracknell and assimilated into model runs. Only data from the main hours of 00 UTC, 06 UTC, 12UTC and 18 UTC are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At RSMC Bracknell, for synoptic stations at or below a height of 500 metres, reported mean sea-level pressure is used in the statistics. If this is unavailable the mean sea-level pressure is calculated from the reported station-level pressure and temperature.

For synoptic stations above 500 metres, the mean sea-level pressure is calculated from the reported station-level pressure and temperature, or, if these are not available the height of a standard pressure-level (e.g.: 850 hPa or 700 hPa). If neither of these are available, the reported mean sea-level pressure is used.

Some stations vary their reporting practice according to the observation hour (e.g.: some stations in the CIS report both mean sea-level and station-level pressure at 00 & 12 UTC, but only mean sea-level pressure at 06 & 18 UTC). For monitoring purposes, reported mean sea-level pressure is stored separately from that calculated from station-level pressure or height of a standard pressure-level. Only statistics for the preferred method (see above) are presented in this report, and so for certain high-level stations, such as those from the CIS, approximately half of the number of observations actually received will appear in the statistics.

Aircraft observations

TABLE 4 contains a list of statistics calculated from data received from all airline carriers.

Figure 3 shows 10 degree lat/long box average numbers of aircraft reports (in AIREP/AMDAR code, including AIREPs, ACARs, AMDARs and ASDARs) received per day throughout the month at Bracknell and assimilated into model runs in the layer 70-500 hPa. Observations with a vector wind difference (compared with the model background field) of >60 m s^{-1} have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4-7 show wind statistics for AIREP/ASDAR (in AIREP/AMDAR code, including AIREPs, ACARs, AMDARs and ASDARs) in the layer 70-500 hPa. Observations with a vector wind difference > 60 m s^{-1} have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure	Parameter
4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (m s^{-1})
7	RMS observation-background vector (m s^{-1})

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Bracknell and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-27 show satellite mean observation-background temperature differences for NOAA-11 soundings at 500 km resolution and figures 28-30 show the same statistics for NOAA-14. Data are plotted where there are > 30 observations in a 10 degree lat/long box.

N.B. 500 km SATEMs are no longer assimilated into the UKMO global Unified Model. Both 500 km and 120 km SATEMs were replaced on 16th April 1996 by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS (from NOAA-11 and NOAA-14).

Figure	Layer (hPa)
25/28	850-1000
26/29	100-300
27/30	30-50

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Bracknell during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Bracknell in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Bracknell from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics (**Geopotential Height and Windspeed at 100 and 500 hPa**) for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

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Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.
6. Sept 97 Monitoring statistics for NOAA-12 removed. Figures 25-27 now show data for NOAA-11
7. January 1998. Increase in resolution of UKMO global forecast model.
8. April 1998. GOES winds ceased on 2nd March 1998, and were replaced with GOES high resolution winds from 15th.
9. June 1998. Monitoring statistics for Meteosat-6 were replaced by monitoring statistics for Meteosat-7, from 3rd June.
10. June 1998. Corrections in our processing of radiosonde data resulted in a decrease in the number of 500hPa geopotential heights in Figure 8 of about 230 per 24 hours (compared with previous reports), and a small increase in the number of 300hPa winds in Figure 9.
11. July 1998. Meteosat-5 began transmitting winds from 2nd July, at 63 degrees East (over the Indian ocean), and this data is included in the statistics.
12. July 1998. GOES-9 (at 135W) was replaced mid-month by GOES-10 (initially at 105W, moving towards 135W).

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: BRACKNELL
MONTH: July 1998

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from each unique identifier for ships, fixed buoys and platforms.
Standard of comparison	:Background field from Bracknell global model.
Observation times	:00, 06, 12, 18 UTC
Elements monitored	:Mean sea level pressure (hPa). :Wind speed (m s^{-1}). :Wind direction (Degrees).

Parameters monitored

:NOBS	:Number of observations received excluding duplicates.
:NGE	:Number of observations with gross errors.
:PGE	:Percentage of observations with gross errors.
:SD	:SD of difference of observations from background values excluding those with gross errors.
:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. a positive bias indicates the observation is veered to the background.**
:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT :15 hPa (pressure)
:25 m s^{-1} (vector wind)

SELECTION CRITERIA

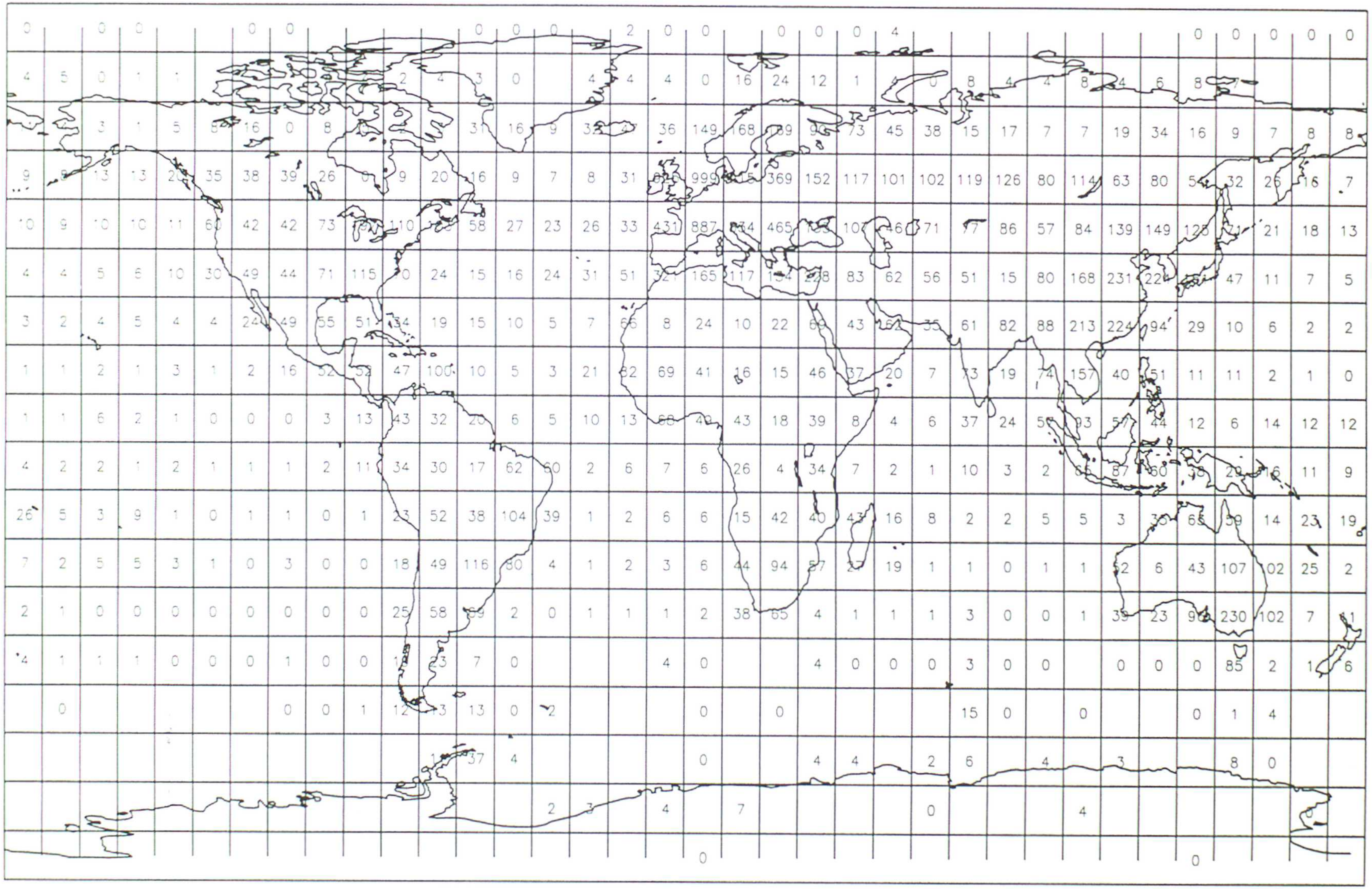
:NOBS	≥ 20 , and one or more of the following:	
1.| bias|	≥ 4 hPa ≥ 5 m s^{-1} > 30 degrees	(pressure), (wind speed), (direction).
2.SD	> 6 hPa > 80 degrees	(pressure), (direction).
3.PGE	> 25	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE									
C6HQ07	ALL	P	SUR	28	1	4	1.3	-5.3	5.5
DUWH	ALL	P	SUR	159	0	0	1.2	-4.6	4.7
ELUB5	ALL	P	SUR	68	2	3	3.9	6.7	7.8
MVNW9	ALL	P	SUR	53	1	2	3.6	4.7	5.9
MWZD2	ALL	P	SUR	25	5	20	2.3	6.0	6.4
OZNF2	ALL	P	SUR	35	0	0	1.4	4.4	4.6
PCBU	ALL	P	SUR	21	1	5	1.0	11.4	11.4
UCJR	ALL	P	SUR	58	0	0	1.6	4.2	4.4
UCUF	ALL	P	SUR	31	0	0	3.4	6.3	7.1
UYPO	ALL	P	SUR	24	0	0	1.8	6.2	6.4
VCTV	ALL	P	SUR	39	22	56	5.1	-5.4	7.4
VRVI2	ALL	P	SUR	25	0	0	1.5	5.1	5.3
V2XO	ALL	P	SUR	37	0	0	1.4	-7.2	7.4
WCV7620	ALL	P	SUR	31	0	0	1.3	5.5	5.6
WDZB	ALL	P	SUR	48	0	0	1.6	-5.5	5.8
XLW363	ALL	P	SUR	23	0	0	1.0	4.6	4.7
3FGN3	ALL	P	SUR	23	2	9	2.4	-5.3	5.8
3FUQ7	ALL	P	SUR	21	0	0	1.0	6.8	6.8
9VVK	ALL	P	SUR	39	3	8	2.7	4.8	5.6
WIND SPEED									
CGCDFC	ALL	SPEED	SUR	22	0	0	8.3	8.2	11.7
C6KE3	ALL	SPEED	SUR	58	0	0	4.2	7.3	8.4
DGCDFD	ALL	SPEED	SUR	49	0	0	6.2	5.1	8.0
DGDD	ALL	SPEED	SUR	78	0	0	6.7	5.8	8.9
DQVK	ALL	SPEED	SUR	86	0	0	6.0	6.2	8.6
ELFT9	ALL	SPEED	SUR	37	0	0	4.0	6.0	7.2
LAOX4	ALL	SPEED	SUR	29	0	0	2.0	-5.1	5.4
OUEK	ALL	SPEED	SUR	105	1	1	5.8	5.2	7.8
PFFH	ALL	SPEED	SUR	59	0	0	7.3	6.8	10.0
PJOX	ALL	SPEED	SUR	47	0	0	3.5	9.7	10.4
P3XM4	ALL	SPEED	SUR	36	0	0	4.7	6.1	7.7
S6BP	ALL	SPEED	SUR	20	0	0	2.0	5.3	5.6
VNAH	ALL	SPEED	SUR	25	0	0	3.7	5.0	6.3
VRUN4	ALL	SPEED	SUR	36	0	0	4.4	5.6	7.2
9KKX	ALL	SPEED	SUR	26	0	0	4.1	5.9	7.2
9MAY6	ALL	SPEED	SUR	26	0	0	6.2	5.4	8.2
9MBK8	ALL	SPEED	SUR	25	1	4	6.9	7.7	10.3
WIND DIRECTION									
ELTQ5	ALL	DIRN.	SUR	29	0	0	88.2	-0.2	88.2
SYMK	ALL	DIRN.	SUR	41	0	0	84.8	-1.4	84.8
V7AJ2	ALL	DIRN.	SUR	22	0	0	101.2	-2.5	101.2
13008	ALL	DIRN.	SUR	80	0	0	13.1	33.1	35.6
21004	ALL	DIRN.	SUR	97	0	0	22.4	30.1	37.5
3EXQ3	ALL	DIRN.	SUR	21	0	0	42.1	-30.2	51.8
3FFF8	ALL	DIRN.	SUR	22	0	0	58.0	-31.2	65.8
32318	ALL	DIRN.	SUR	21	0	0	20.5	-57.4	61.0
45135	ALL	DIRN.	SUR	144	0	0	23.8	85.4	88.7
46053	ALL	DIRN.	SUR	28	0	0	14.7	-35.9	38.7
63104	ALL	DIRN.	SUR	54	0	0	120.2	20.5	122.0
63112	ALL	DIRN.	SUR	54	0	0	117.2	21.6	119.2

AVAILABILITY - SHIP/SYNOP - JULY 1998
MAIN HOURS ONLY
10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS
GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 20435

FIGURE 1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9 8 13 13 20 35 38 39 26 0 9 20 16 9 7 8 31 826 999 415 369 152 117 101 102 119 126 80 114 63 80 54 32 26 16 7
10 9 10 10 11 60 42 42 73 191 110 143 58 27 23 26 33 431 887 334 465 103 107 46 71 77 86 57 84 139 149 128 71 21 18 13
4 4 5 6 10 30 49 44 71 115 30 24 15 16 24 31 51 321 165 117 134 228 83 62 56 51 15 80 168 231 224 164 47 11 7 5
3 2 4 5 4 4 24 49 55 51 34 19 15 10 5 7 66 8 24 10 22 69 43 162 35 61 82 88 213 224 94 29 10 6 2 2
1 1 2 1 3 1 2 16 32 52 47 100 10 5 3 21 82 69 41 16 15 46 37 20 7 73 19 74 157 40 51 11 11 2 1 0
1 1 6 2 1 0 0 0 3 13 43 32 20 6 5 10 13 68 49 43 18 39 8 4 6 37 24 50 93 57 44 12 6 14 12 12
4 2 2 1 2 1 1 1 2 11 34 30 17 62 60 2 6 7 6 26 4 34 7 2 1 10 3 2 65 87 60 38 29 16 11 9
26 5 3 9 1 0 1 1 0 1 23 52 38 104 39 1 2 6 6 15 42 40 43 16 8 2 2 5 5 3 35 65 59 14 23 19
7 2 5 5 3 1 0 3 0 0 18 49 116 80 4 1 2 3 6 44 94 57 27 19 1 1 0 1 1 52 6 43 107 102 25 2
2 1 0 0 0 0 0 0 0 0 25 58 69 2 0 1 1 1 2 38 65 4 1 1 1 3 0 0 1 39 23 96 230 102 7 11
4 1 1 1 0 0 0 1 0 0 18 23 7 0 4 0 4 0 0 0 3 0 0 0 0 0 85 2 1 6
0 0 0 1 12 13 13 0 2 0 0 15 0 0 0 1 4
1 37 4 0 4 4 2 6 4 3 8 0
2 3 4 7 0 4 0
0 0

TABLE 2

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: BRACKNELL
MONTH: July 1998

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoys.

Standard of comparison :Background field from Bracknell global model.

Position :Average latitude and longitude for period.

Observation times :00, 06, 12, 18 UTC

Elements monitored
:Mean sea level pressure (hPa).
:Wind speed (m s^{-1}).
:Wind direction (degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT
:15 hPa (pressure)
:25 m s^{-1} (vector wind)

SELECTION CRITERIA : NOBS > 20 , and one or more of the following:

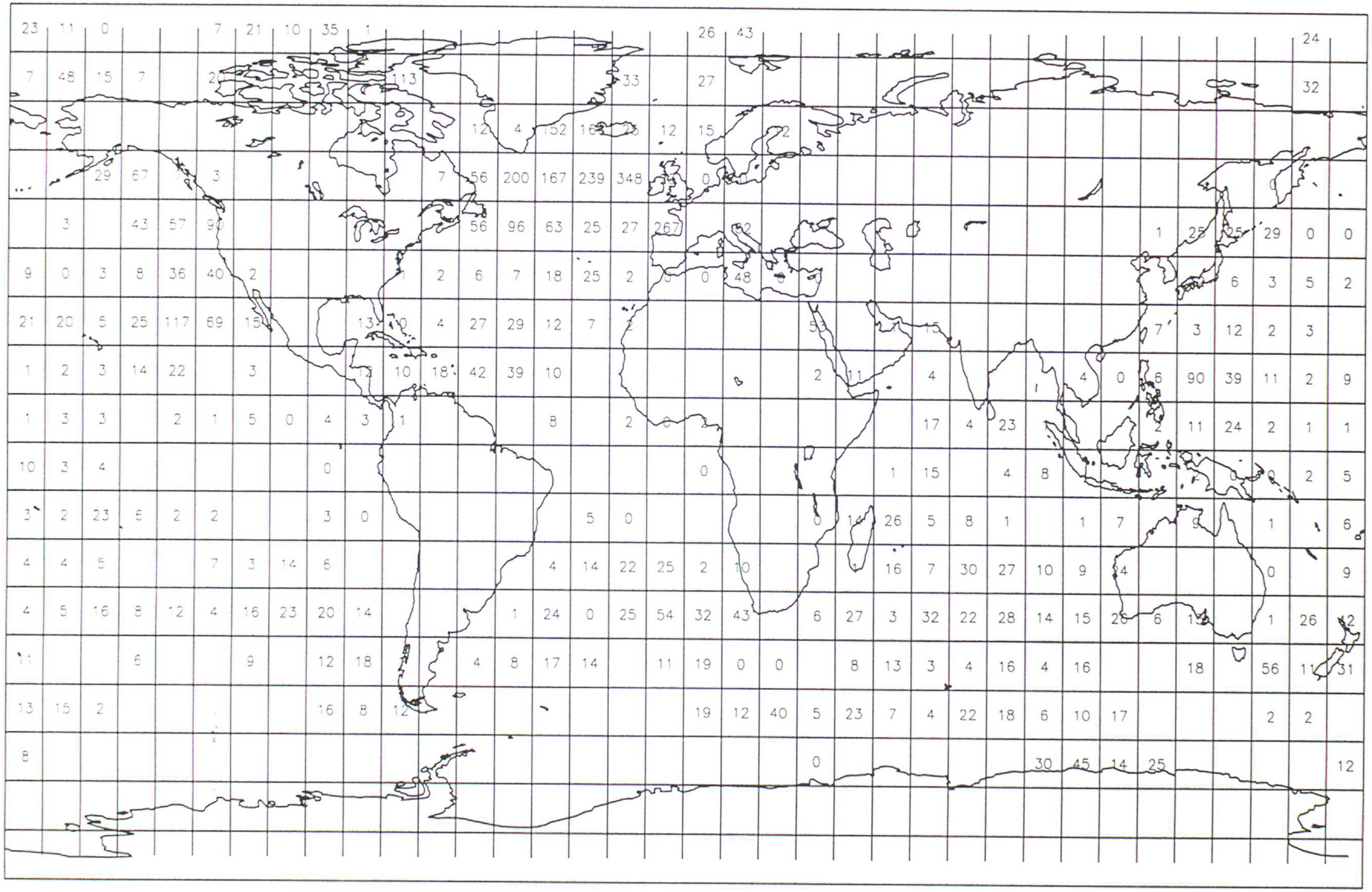
1.| bias|	> 4 hPa	(pressure),
	> 5 m s^{-1}	(wind speed),
	> 30 degrees	(direction).
2.SD	> 6 hPa	(pressure),
	> 80 degrees	(direction).
3.PGE	> 25.	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
17511	-35.4	77.0	ALL	P	SUR	80	0	0	1.5	-8.7	8.9
23928	3.0	83.3	ALL	P	SUR	138	1	1	1.9	10.2	10.3
31529	-34.7	-15.3	ALL	P	SUR	214	0	0	4.4	-7.2	8.4
34910	-54.1	-92.1	ALL	P	SUR	385	16	4	4.3	4.0	5.9
42852	28.4	-87.4	ALL	P	SUR	32	31	97	0.0	14.9	14.9
54920	-31.3	-93.4	ALL	P	SUR	80	32	40	1.1	-0.7	1.3
54927	-34.3	-138.4	ALL	P	SUR	192	120	63	5.7	-5.3	7.8
54931	-43.7	-116.6	ALL	P	SUR	271	20	7	4.1	4.6	6.2
WIND SPEED											
52657	26.4	127.8	ALL	SPEED	SUR	32	0	0	1.8	-6.1	6.3
WIND DIRECTION											
23583	-9.9	66.9	ALL	DIRN.	SUR	358	0	0	11.2	-30.9	32.9
41633	12.5	-47.9	ALL	DIRN.	SUR	46	0	0	28.6	-36.5	46.4
41636	17.7	-47.9	ALL	DIRN.	SUR	89	0	0	23.3	-56.7	61.3
52534	10.1	125.7	ALL	DIRN.	SUR	187	0	0	68.5	-59.0	90.4
52540	13.4	144.7	ALL	DIRN.	SUR	195	0	0	44.7	58.2	73.4
52624	-14.3	138.7	ALL	DIRN.	SUR	186	0	0	23.0	41.2	47.2
52657	26.4	127.8	ALL	DIRN.	SUR	207	0	0	149.9	11.3	150.3

AVAILABILITY – DRIFTER – JULY 1998
MAIN HOURS ONLY
10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS
GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 5799

FIGURE 2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7 48 15 7 20 113 33 27 32
12 4 152 12 15
29 67 3 7 56 200 167 239 348 0
3 43 57 56 96 63 25 27 267 1 29 0 0
9 0 3 8 36 40 2 2 6 7 18 25 2 0 48 6 3 5 2
21 20 5 25 117 69 15 13 4 27 29 12 7 7 3 12 2 3
1 2 3 14 22 3 10 18 42 39 10 2 11 4 4 0 6 90 39 11 2 9
1 3 3 2 1 5 0 4 3 1 8 2 17 4 23 2 11 24 2 1 1
10 3 4 0 0 1 15 4 8 2 5
3 2 23 6 2 2 3 0 5 0 0 14 26 5 8 1 1 7 9 1 6
4 4 5 7 3 14 6 4 14 22 25 2 10 16 7 30 27 10 9 0 9
4 5 16 8 12 4 16 23 20 14 1 24 0 25 54 32 43 6 27 3 32 22 28 14 15 6 1 26
11 6 9 12 18 4 8 17 14 11 19 0 0 8 13 3 4 16 4 16 18 56 31
13 15 2 16 8 12 19 12 40 5 23 7 4 22 18 6 10 17 2 2
8 0 30 45 14 25 12

TABLE 3

MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: BRACKNELL
MONTH: July 1998

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for synops & autosynops.

Standard of comparison :Background field from Bracknell global model.

Observation times :00, 06, 12, 18 UTC

Elements monitored :Mean sea level pressure (hPa).

Parameters monitored

:HT(m) :Station height (in metres) as given in WMO No. 9 Vol A

:RP :Pressure reporting practice
M=mean sea level pressure (hPa) reported.
S=Station level pressure reported.
8=Geopotential height (m) of 850 hPa surface reported.
7=Geopotential height (m) of 700 hPa surface reported.

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:%REJ :Percentage of observations flagged.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT :15 hPa (pressure)

SELECTION CRITERIA :NOBS > 20 ,and one or more of the following:

1.| bias| > 4 hPa
2. SD > 6 hPa
3.PGE > 25.

N.B. For stn ht > 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

WMO REGION 1:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
60010	28.3N	16.5W	2367	S7	91	0	0	44	1.5	-7.5	7.6
60445	36.2N	5.4E	1081	S8	113	1	1	0	0.7	4.5	4.6
60468	35.6N	6.2E	1052	S8	82	80	98	0	0.3	2.6	2.6
60511	35.3N	1.4E	1127	S8	115	56	49	0	1.9	14.1	14.2
60535	34.7N	3.3E	1144	S8	89	0	0	0	1.0	-5.6	5.7
60571	31.6N	2.2W	773	S8	115	1	1	0	0.9	-4.1	4.2
60670	24.6N	9.5E	1054	S8	107	3	3	3	1.4	9.2	9.3
63330	13.5N	39.5E	2070	MS	58	58	100	0	0.0	0.0	0.0
63333	11.1N	39.7E	1903	MS	54	1	2	26	1.4	4.7	4.9
63334	10.3N	37.7E	2515	MS	52	1	2	2	0.7	10.8	10.8
63402	7.7N	36.8E	1725	MS	96	1	1	0	1.1	8.3	8.4
63450	9.0N	38.8E	2354	MS	112	0	0	0	0.8	5.2	5.3
63471	9.6N	41.9E	1260	MS	44	0	0	0	1.4	10.4	10.5
63478	5.9N	43.6E	295	MS	29	0	0	0	0.8	7.2	7.2
63661	1.0N	35.0E	1890	8	106	2	2	0	1.3	4.2	4.4
68343	27.6S	25.6E	1228	S8	111	0	0	100	0.9	-9.5	9.5
68396	26.5S	31.3E	641	S8	57	0	0	2	1.4	4.1	4.3
68442	29.1S	26.3E	1359	S8	112	0	0	100	0.8	-4.7	4.8
68717	30.0S	19.0E	122	MS	102	0	0	57	2.1	4.0	4.5
69679	43.9N	18.3E	1557	MS	77	77	100	0	0.0	0.0	0.0

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
30320	56.9N	105.7E	669	MS	20	11	55	0	1.3	0.0	1.3
30554	54.5N	113.6E	995	MS	115	0	0	50	4.5	5.8	7.3
40743	36.2N	57.7E	941	MS	112	0	0	0	1.0	-5.3	5.4
40762	35.3N	59.2E	1333	MS	110	0	0	0	0.9	-11.9	11.9
41254	23.1N	57.7E	1755	S8	77	77	100	0	0.0	0.0	0.0
41304	18.1N	55.2E	269	MS	84	42	50	0	1.2	-0.4	1.3
44416	28.6N	81.6E	720	MS	77	2	3	0	2.1	5.0	5.4
44477	27.0N	87.4E	1445	S8	73	73	100	0	0.0	0.0	0.0
52602	38.8N	93.4E	2734	S	118	0	0	0	1.1	-6.5	6.6
53588	39.0N	113.5E	2898	S	120	120	100	0	0.0	0.0	0.0
54587	39.1N	123.2E	118	M	117	0	0	2	1.3	-4.2	4.4
56021	34.1N	95.8E	4176	S	119	0	0	0	0.8	-4.0	4.1
56144	31.8N	98.6E	3184	S	104	1	1	0	1.0	-4.6	4.7
56385	29.5N	103.3E	3049	S	119	0	0	0	1.1	-5.1	5.2
56444	28.5N	98.9E	3488	S	117	2	2	0	0.8	13.2	13.2
56462	29.0N	101.5E	2994	S	117	1	1	1	1.4	7.8	7.9
56954	22.6N	99.9E	1054	M	119	0	0	5	1.1	4.3	4.4

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
80099	7.1N	70.7W	128	MS	28	0	0	0	1.3	-4.9	5.1
82212	2.5S	66.2W	55	MS	70	1	1	4	1.4	-4.0	4.2
82704	7.6S	72.7W	170	MS	70	0	0	0	1.1	-5.4	5.5
83214	10.3S	54.9W	285	MS	59	0	0	2	1.4	-7.5	7.6
83235	12.4S	46.4W	604	MS	80	1	1	0	0.7	6.2	6.2
83319	14.7S	52.4W	315	MS	73	0	0	0	1.3	-5.6	5.7
83332	14.1S	46.4W	826	MS	80	7	9	3	2.3	13.0	13.2
83408	14.3S	43.8W	447	MS	73	0	0	1	1.0	9.7	9.8
83423	16.7S	49.3W	741	MS	80	0	0	0	0.9	-6.2	6.3
83531	18.6S	46.5W	940	MS	74	0	0	1	1.0	-7.7	7.8
83587	19.9S	43.9W	850	MS	79	0	0	1	1.1	-7.3	7.4
83704	22.3S	53.9W	369	MS	63	9	14	0	1.8	-9.6	9.8
83773	23.1S	48.9W	793	S	44	0	0	0	1.0	-6.6	6.7
84401	5.2S	80.6W	49	MS	84	0	0	0	1.1	5.1	5.2
84455	6.5S	76.4W	281	MS	58	0	0	2	2.4	5.3	5.8

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
84472	7.1S	78.5W	2620	S	46	0	0	0	0.9	-5.9	6.0
84686	13.6S	72.0W	3248	S	85	0	0	0	1.2	-5.5	5.6
84782	18.1S	70.3W	468	MS	85	0	0	1	1.6	7.5	7.7
85312	19.8S	63.9W	992	S	24	23	96	29	0.0	-13.7	13.7
85406	18.3S	70.3W	55	M	115	0	0	0	1.5	5.0	5.2

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
76118	30.4N	109.7W	1040	MS	21	0	0	0	0.8	-9.1	9.1
76625	20.6N	100.4W	1813	MS	65	0	0	3	1.1	-7.4	7.5
76632	20.1N	98.7W	2417	MS	24	1	4	4	0.5	-5.5	5.5
76658	19.2N	103.7W	494	MS	41	0	0	0	1.1	6.4	6.5
76698	19.6N	88.0W	20	MS	77	0	0	0	1.0	-6.4	6.5
76762	17.5N	99.5W	1865	MS	68	68	100	0	0.0	0.0	0.0
76845	16.7N	92.6W	2276	MS	86	85	99	0	0.0	14.6	14.6
78718	14.4N	87.6W	626	MS	70	47	67	0	0.5	-14.3	14.3

WMO REGION 5:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
94328	22.4S	133.6E	623	MS	92	0	0	0	0.9	6.5	6.6
94955	41.6S	145.7E	684	MS	113	113	100	0	0.0	0.0	0.0
95952	41.9S	145.6E	560	MS	113	113	100	0	0.0	0.0	0.0

WMO REGION 6:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
02045	67.8N	20.4E	408	M	81	81	100	0	0.0	0.0	0.0
16227	41.9N	13.6E	655	MS	303	294	97	0	1.0	-14.1	14.1
16614	40.4N	21.3E	604	MS	92	0	0	0	1.3	-6.6	6.7
17092	39.8N	39.5E	1218	S8	119	0	0	2	1.5	6.1	6.3
17203	38.9N	40.5E	1177	S8	105	0	0	0	1.6	4.3	4.6

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89004	71.7S	2.8W	815	MS	250	3	1	1	3.7	-6.0	7.0
89066	68.1S	67.1W	4	MS	112	2	2	5	3.3	-4.3	5.4
89345	81.7S	148.8W	620	S	390	76	19	0	3.7	-10.1	10.8

TABLE 4

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: July 1998

Monitoring procedures

Period		:One calendar month.
Data monitored		:Statistics for each airline carrier.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:All hours combined.
Level(s) monitored		:70.0 - 500.0 hPa
Elements monitored		:TEMP in °C ; WIND in m s^{-1}
Parameters monitored		
	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.
GROSS ERROR LIMITS		:10.0 °C ; 60 m s^{-1} Vector Wind
SELECTION CRITERIA		:N REP ≥ 20

NB: US ACARs and ADS data are shown at the bottom of the table as US ACAR and ADS respectively.

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAA	81	0	15	2.1	1.0	78	0	18	0	11.5	1.5
AAH	62	2	35	3.1	1.8	61	0	26	0	6.7	0.5
AAL	6445	0	31	1.7	-0.1	5384	0	24	0	7.2	1.1
AAR	1319	1	9	1.9	-0.7	1292	0	9	0	7.5	0.4
ACA	2540	1	9	2.0	0.1	2340	0	4	0	6.7	0.4
ACI	68	1	43	1.8	-0.2	68	0	44	0	10.7	3.3
AEA	655	1	27	2.3	1.0	542	0	20	0	7.4	0.0
AEL	623	1	16	1.6	-0.7	613	0	16	0	7.8	0.7
AEY	193	1	6	1.6	0.8	179	0	4	0	6.9	1.4
AFL	460	1	11	2.4	0.9	425	0	8	0	8.5	0.3
AFR	1900	1	12	1.7	0.0	1785	0	13	0	8.2	0.8
AIH	199	1	9	1.5	0.2	137	1	6	0	7.1	1.0
AJM	109	2	8	1.5	-0.7	95	0	4	0	9.8	0.9
AMT	1318	0	45	1.9	0.8	1276	0	45	0	6.3	1.0
AMX	309	0	5	1.5	0.3	303	0	5	0	7.6	0.6
ANA	1154	1	5	1.6	-0.2	1140	0	5	0	7.2	0.7
ANQ	25	0	0	0.7	0.1	25	0	0	0	5.6	2.3
ANZ	3757	2	37	1.8	0.0	3671	0	37	0	8.2	0.8
AOM	915	2	11	1.8	0.9	815	0	11	0	7.7	0.9
ARG	32	6	31	2.9	0.1	37	0	32	0	21.8	6.1
ASY	54	0	17	1.2	0.6	53	0	21	0	9.8	-0.8
AUA	43	0	30	2.2	-0.5	36	0	11	0	8.7	1.5
AVA	490	0	4	1.5	0.2	489	0	6	0	7.9	1.3
AVN	92	1	11	1.7	0.1	93	0	8	0	8.4	-0.2
AXA	109	1	38	2.2	0.6	108	0	36	0	9.9	2.0
AZA	470	0	21	2.0	-0.1	372	0	14	0	7.5	0.6
BAL	932	0	17	1.4	-0.4	878	0	17	0	7.3	0.5
BAW	1716	0	19	2.0	-0.1	1486	0	13	0	6.8	0.9
BBB	49	2	10	2.1	-0.5	44	0	2	0	4.8	-0.5
BWA	383	1	16	1.9	0.6	328	0	12	0	7.5	1.5
CAL	2238	0	6	1.6	-0.6	2218	0	8	0	7.9	0.8
CCA	260	2	12	2.5	0.9	282	0	13	0	11.0	0.4
CDN	2805	0	10	1.8	0.2	2667	0	8	0	7.5	0.8
CES	446	1	7	1.4	0.1	444	1	9	0	8.9	0.4
CFG	1054	0	5	1.6	-0.9	1002	0	5	0	7.7	0.5
CKS	365	1	40	2.3	0.6	348	0	39	0	5.9	1.6
CKT	201	2	17	1.8	0.8	167	0	11	0	8.4	0.7
CLX	308	0	7	2.0	-0.5	297	0	5	0	7.0	1.0
CMI	599	1	5	1.6	0.3	571	0	5	0	8.0	0.9
CMM	614	0	12	1.7	0.1	560	0	8	0	6.3	0.7
COA	1815	1	35	1.5	0.0	1583	0	32	0	9.3	1.7
CPA	69	0	1	1.6	-0.4	71	0	4	0	7.3	0.3
CRL	766	1	7	1.6	0.4	707	0	7	0	6.8	1.3
CSN	57	0	11	1.4	0.6	54	0	13	0	8.3	0.5
CTB	433	0	2	1.6	-0.6	423	0	1	0	5.8	0.6
CTM	196	2	31	2.4	-0.8	184	0	28	0	8.6	1.5
CUB	477	2	13	2.6	1.3	429	0	11	0	10.3	1.7
DAL	5867	1	37	2.1	0.4	5028	0	32	0	6.5	0.7
DBY	309	1	2	1.3	-0.8	299	0	3	0	7.4	0.4
DHL	195	11	100	5.7	-4.1	147	0	18	0	8.9	1.1
DLH	3474	0	17	2.0	-0.1	3072	0	13	0	7.1	1.0
EIA	411	0	38	1.5	0.3	392	0	39	0	9.0	1.3
EIN	27	0	0	1.4	0.3	29	0	0	0	7.7	2.7
ELY	211	0	16	1.7	-0.1	197	1	16	0	9.8	1.3
ETH	23	0	13	2.3	-0.7	21	0	10	0	8.8	2.4
EVA	2572	0	7	1.5	-0.4	2569	0	7	0	7.4	0.5
EWW	118	1	28	2.5	0.9	96	0	100	0	14.6	3.3
FDX	1351	0	22	1.7	0.5	1242	0	18	0	6.8	0.6

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
FIN	619	0	22	2.3	0.4	475	1	11	0	7.3	0.8
FJI	880	4	42	1.5	0.3	842	0	40	0	8.8	-0.3
FOM	231	3	41	1.4	0.4	225	0	39	0	7.8	1.4
GAF	95	0	24	2.3	0.3	69	0	12	0	8.1	1.9
GCO	107	2	21	1.2	0.7	107	0	20	0	6.0	0.6
GHA	99	2	6	2.2	0.3	71	0	4	0	8.6	2.8
GIA	64	2	27	2.1	0.9	65	0	25	0	6.8	1.6
GRL	34	0	0	1.6	0.2	32	0	0	0	5.7	1.9
GTI	42	2	14	2.2	0.9	39	0	3	0	7.8	1.2
HAL	3125	0	40	1.2	0.1	3023	0	40	0	6.9	1.4
HLF	87	0	13	1.5	-0.6	75	0	7	0	5.9	0.2
HRH	187	7	67	1.6	0.2	170	0	64	0	7.1	1.0
IBE	2941	1	21	1.8	0.4	2590	0	16	0	7.5	1.1
ICE	941	1	30	2.5	0.2	715	0	17	0	7.5	0.4
JAL	7020	0	5	1.7	0.2	6861	0	5	0	7.6	1.0
JAZ	48	0	6	2.0	1.4	47	0	4	0	6.7	0.9
JKK	318	1	31	1.7	-0.1	256	0	20	0	6.9	0.1
KAL	3950	1	8	1.6	-0.4	3872	0	9	0	7.4	0.8
KIW	32	13	53	2.7	2.2	29	0	45	0	8.9	-2.4
KLM	3361	1	22	1.7	0.0	3142	0	20	0	7.6	0.8
LAN	28	7	21	3.3	-0.2	27	0	11	0	12.6	2.0
LAP	34	18	82	6.8	-6.2	34	15	100	0	35.2	22.6
LDA	160	0	24	1.6	-0.8	143	1	19	0	6.4	0.4
LDI	442	0	24	1.6	-0.9	385	0	21	0	7.6	0.5
LEI	172	1	14	1.6	0.6	160	0	11	0	9.4	0.7
LIB	417	0	5	1.7	0.7	411	0	5	0	7.7	1.3
LOT	332	1	23	2.3	-1.3	273	1	12	0	7.0	0.3
LTU	1025	0	22	1.8	-0.1	842	0	13	0	6.5	1.0
LXR	124	2	15	1.7	0.9	115	1	18	0	9.3	1.9
MAH	50	0	32	2.1	-0.9	41	0	20	0	9.1	0.2
MAS	416	1	13	1.5	-0.2	404	0	10	0	7.3	0.4
MDA	178	1	2	1.3	0.1	175	0	3	0	7.9	-0.5
MON	164	0	16	1.3	0.2	141	0	9	0	7.0	0.6
MPD	387	1	19	1.9	0.5	338	0	11	0	7.8	1.2
MPH	971	0	7	1.8	-0.8	916	0	5	0	6.7	0.5
NCA	611	0	5	1.5	0.2	598	0	6	0	8.4	0.8
NWA	11504	1	13	1.7	0.4	10957	0	11	0	7.7	0.7
OAL	31	0	19	3.3	2.8	26	0	12	0	8.5	-0.8
PAC	184	1	27	1.9	0.4	150	1	27	0	7.6	1.0
PAL	614	0	4	1.6	-0.2	599	0	5	0	8.5	0.4
PAO	361	1	50	1.9	-0.1	361	0	51	0	8.3	0.3
PAQ	39	0	5	1.5	0.1	39	0	8	0	11.8	0.5
QFA	1821	0	34	1.6	0.0	1806	0	34	0	8.0	0.9
RAF	135	0	6	1.7	0.6	133	0	7	0	8.3	0.8
RAM	100	1	4	1.8	-0.1	100	1	10	0	9.3	-0.6
RCH	517	2	25	2.3	0.5	468	0	22	0	9.5	1.2
RKA	129	3	6	1.3	0.0	88	0	5	0	7.2	2.4
ROY	331	2	16	2.1	-0.3	285	0	8	0	8.2	1.3
RRR	205	1	29	2.2	-0.2	175	0	22	0	8.1	0.3
RYN	512	0	46	1.2	0.0	500	0	47	0	5.5	1.0
SAA	291	2	5	1.6	0.1	259	0	6	0	9.3	1.3
SAB	115	0	14	1.9	0.4	99	0	10	0	7.3	1.2
SAS	1507	0	1	1.9	-0.3	1487	0	1	0	7.1	0.5
SCX	40	20	55	1.0	0.1	34	0	53	0	3.6	0.9
SIA	1567	0	5	1.6	-0.7	1559	0	6	0	7.2	0.5
SKN	30	0	47	1.9	0.8	29	0	48	0	7.3	1.2
SLR	160	2	15	1.5	-0.5	163	0	15	0	6.9	-0.1
SOL	55	0	0	1.1	0.2	54	0	2	0	7.0	0.8
SVA	174	1	10	1.7	-0.6	191	1	11	0	8.7	0.9

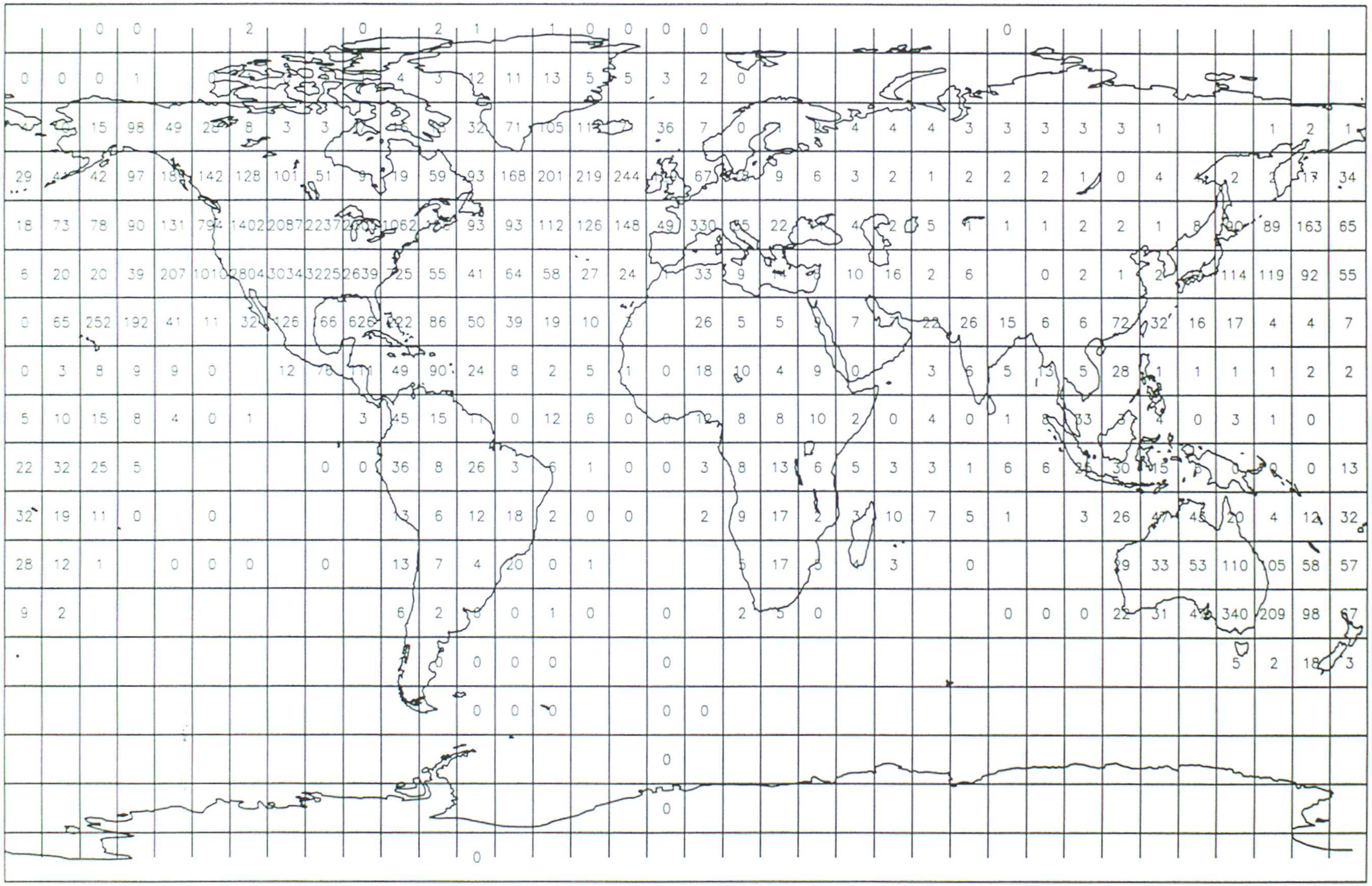
		TEMPERATURE					WIND				
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
SVV	26	0	12	2.2	-0.6	24	0	17	0	13.6	7.9
SWR	168	1	24	1.6	0.1	134	0	14	0	6.8	2.0
TAP	773	1	8	1.5	-0.3	744	0	8	0	7.8	0.7
TBA	65	2	23	3.0	0.3	61	0	26	0	16.5	0.2
THA	602	0	8	1.3	-0.4	596	1	10	0	7.7	0.2
TOW	183	0	29	1.9	0.2	134	0	16	0	7.9	1.2
TPA	41	0	24	1.1	0.2	32	0	22	0	7.7	1.0
TSC	392	1	17	2.1	0.5	337	0	12	0	8.8	1.2
TWA	1960	0	35	1.9	0.3	1445	0	25	0	7.3	0.9
UAL	116870	1	87	1.1	-0.1	116248	0	87	0	5.3	0.3
UPS	1328	1	37	1.6	0.0	1221	0	35	0	6.7	0.9
USA	379	0	29	1.7	-0.2	294	0	18	0	7.3	1.0
VIR	392	1	15	2.0	-0.4	336	0	7	0	6.9	0.5
VKG	57	0	5	1.7	0.3	54	0	4	0	6.7	1.7
VRG	326	2	42	2.3	0.8	281	0	100	0	14.2	1.6
VSP	214	1	18	1.7	0.4	207	0	18	0	8.9	1.1
WOA	91	0	22	1.4	0.4	85	0	21	0	6.8	1.0
AN	20387	0	1	1.4	0.0	20387	0	0	0	6.4	0.9
BA	19597	0	1	1.5	0.6	19566	0	1	0	6.7	0.6
GU	33	0	33	1.4	1.0	29	0	38	0	10.2	1.5
IT	640	0	49	1.2	0.4	640	0	49	0	6.2	0.7
KL	11722	3	12	1.6	0.9	11712	0	33	0	8.2	0.9
LH	3190	0	0	1.8	0.9	3323	0	1	0	6.4	0.8
MK	2320	0	0	1.9	1.6	2309	0	0	0	7.9	0.4
OZ	60	0	48	2.2	-0.7	60	0	48	0	10.4	-0.6
QF	16876	0	1	1.2	0.4	16874	0	1	0	6.2	0.7
SA	4172	0	53	2.0	1.5	4169	0	1	0	7.0	0.6
SV	1002	22	22	1.5	1.4	1000	0	13	0	10.9	1.4
UA	4188	1	37	1.3	0.0	4295	0	36	0	6.8	0.7
WA	789	5	9	1.7	0.4	773	4	100	0	10.3	-1.6
XX	2534	2	4	1.3	0.5	3207	0	100	0	12.5	2.8
N	644	2	27	2.5	0.7	564	0	25	0	9.5	1.1
ADS	551	0	7	1.3	0.0	551	0	6	0	6.1	0.2
US ACARS	550776	0	7	1.1	0.2	550775	0	10	0	5.6	0.5

MEAN DAILY COUNT OF AIRCRAFT 70 – 500 HPA

JULY 1998

OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

FIGURE 3


0 0 2 0 2 1 1 0 0 0 0 0
0 0 0 1 0 4 3 12 11 13 5 5 3 2 0
15 98 49 28 8 3 3 32 71 105 11 36 7 0 4 4 4 3 3 3 3 3 1 1 2 1
29 42 97 142 128 101 51 9 19 59 93 168 201 219 244 67 9 6 3 2 1 2 2 2 1 0 4 2 17 34
18 73 78 90 131 794 1402 2087 2237 1062 93 93 112 126 148 49 330 22 4 2 5 1 1 1 2 2 1 8 89 163 65
6 20 20 39 207 1010 2804 3034 3225 2639 725 55 41 64 58 27 24 33 9 10 16 2 6 0 2 1 2 114 119 92 55
0 65 252 192 41 11 32 126 166 626 22 86 50 39 19 10 26 5 5 7 22 26 15 6 6 72 32 16 17 4 4 7
0 3 8 9 9 0 12 111 49 90 24 8 2 5 1 0 18 10 4 9 0 3 6 5 13 5 28 1 1 1 1 2 2
5 10 15 8 4 0 1 3 45 15 0 12 6 0 0 12 8 8 10 2 0 4 0 1 8 33 4 0 3 1 0
22 32 25 5 0 0 36 8 26 3 1 0 0 3 8 13 6 5 3 3 1 6 6 30 0 13
32 19 11 0 0 6 12 18 2 0 0 2 9 17 2 10 7 5 1 3 26 20 4 32
28 12 1 0 0 0 0 13 7 4 20 0 1 17 3 0 33 53 110 58 57
9 2 6 2 0 1 0 0 2 0 0 0 0 22 31 340 209 98
0 0 0 0 5 2 3
0 0 0 0 0
0
0
0

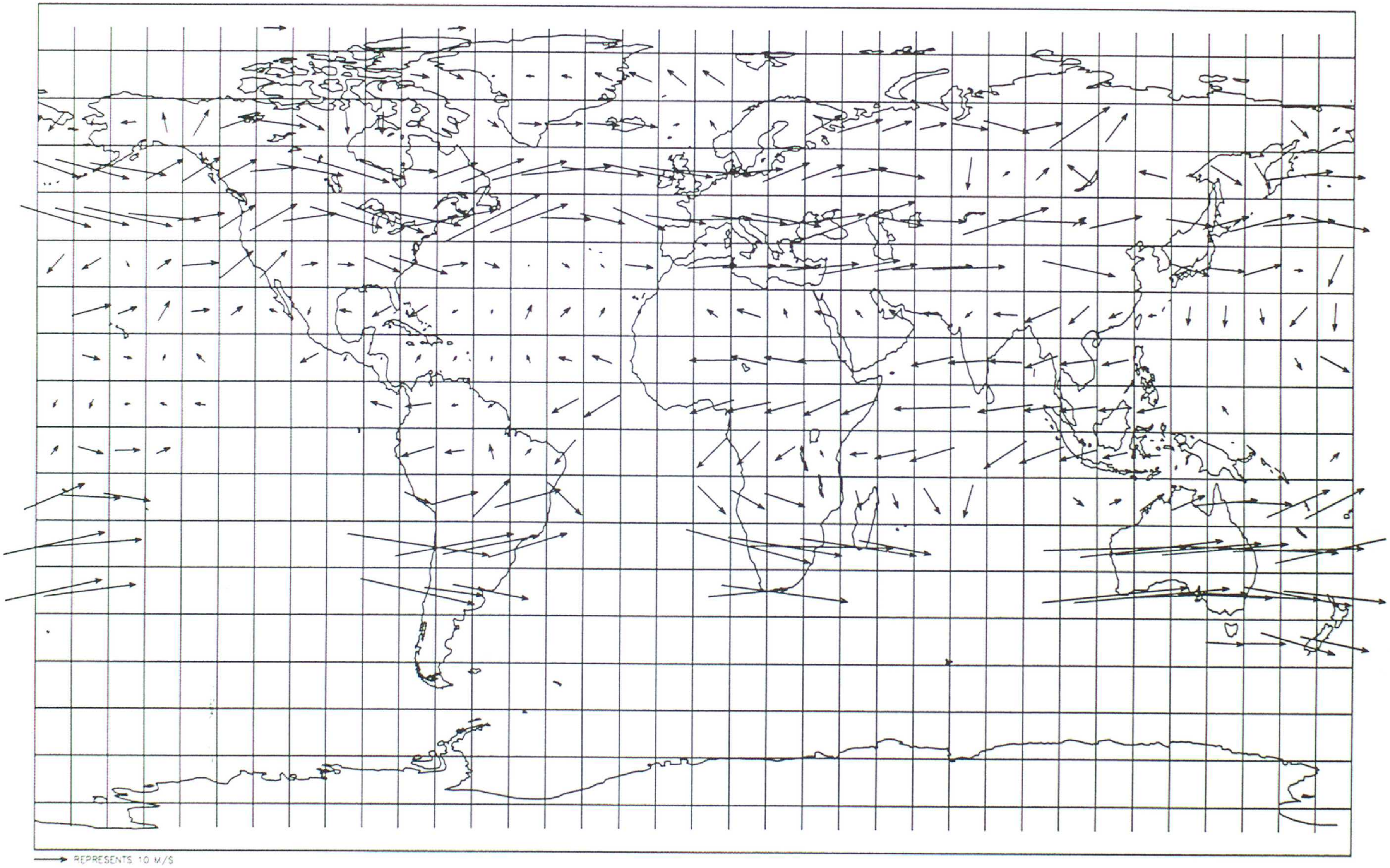
AIRCRAFT MEAN WINDS BETWEEN 70 AND 500 HPA

FIGURE 4

JULY 1998

OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT



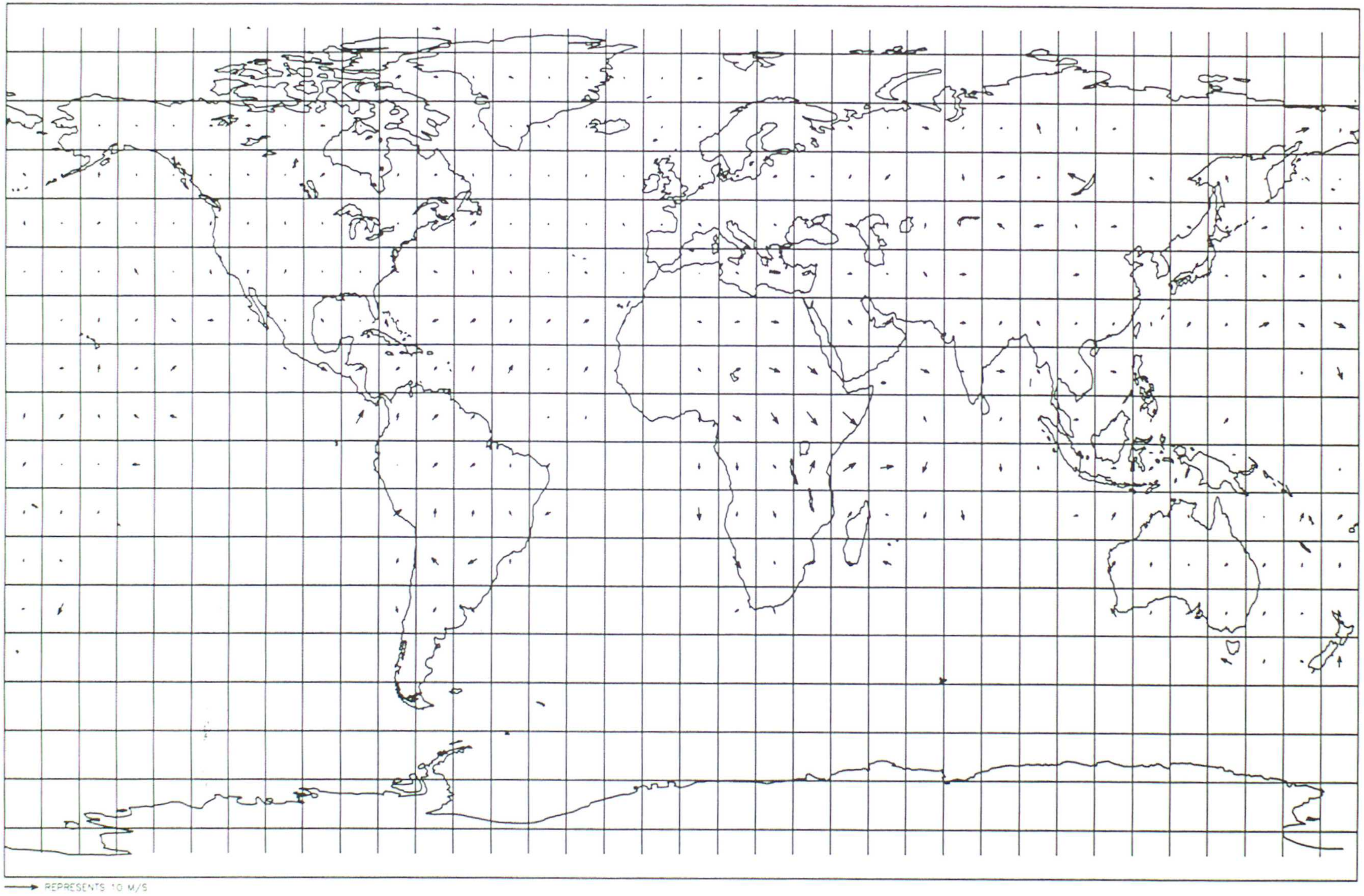
AIRCRAFT MEAN O-B WINDS BETWEEN 70 AND 500 HPA

FIGURE 5

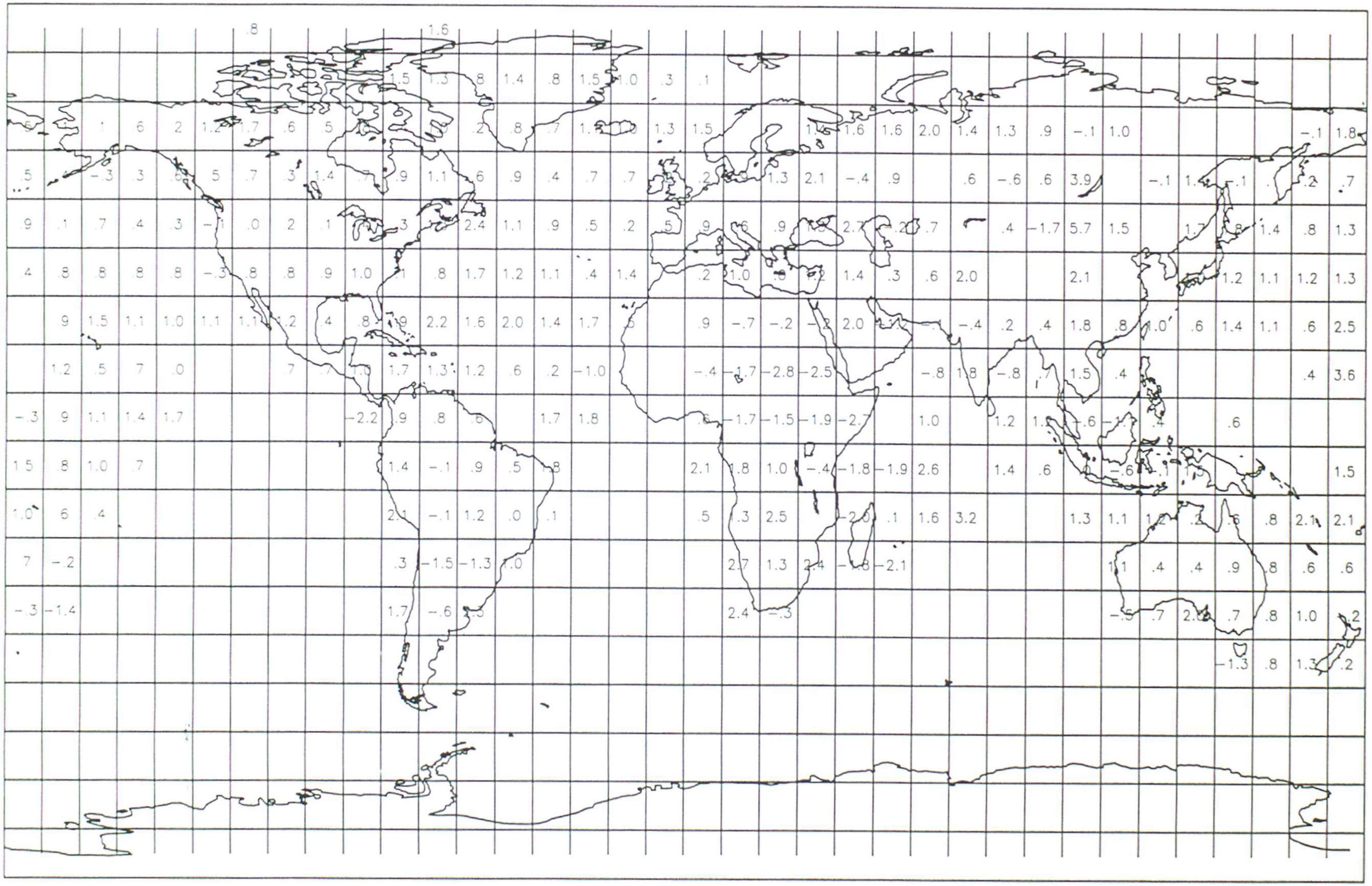
JULY 1998

OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT



AIRCRAFT : MEAN O–B SPEEDS (M/S) BETWEEN 70 AND 500 HPA FIGURE 6
JULY 1998
OBSERVATIONS WITH O–B VECTOR DIFFERENCE > 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT


.8 1.6
1.5 1.3 .8 1.4 .8 1.5 1.0 .3 .1
.5 .1 .6 .2 1.2 1.7 .6 .5 .2 .8 .7 1.3 1.0 1.3 1.5 1.6 1.6 1.6 2.0 1.4 1.3 .9 –.1 1.0 –.1 1.8
.5 –.3 .3 .6 .5 .7 .3 1.4 .7 .9 1.1 .6 .9 .4 .7 .7 .2 1.3 2.1 –.4 .9 .6 –.6 .6 3.9 –.1 1.4 –.1 .2 .7
.9 .1 .7 .4 .3 –.1 .0 .2 .1 .3 2.4 1.1 .9 .5 .2 .5 .9 .6 .9 1.8 2.7 .2 .7 .4 –1.7 5.7 1.5 1.7 .8 1.4 .8 1.3
.4 .8 .8 .8 .8 –.3 .8 .8 .9 1.0 .1 .8 1.7 1.2 1.1 .4 1.4 .2 1.0 .2 1.4 .3 .6 2.0 2.1 1.2 1.1 1.2 1.3
.9 1.5 1.1 1.0 1.1 1.1 1.2 .4 .8 .9 2.2 1.6 2.0 1.4 1.7 .6 .9 –.7 –.2 –.2 2.0 –.4 .2 .4 1.8 .8 1.0 .6 1.4 1.1 .6 2.5
1.2 .5 .7 .0 .7 .7 1.0 1.7 1.3 1.2 .6 .2 –1.0 –.4 –1.7 –2.8 –2.5 –.8 1.8 –.8 .7 1.5 .4 .4 3.6
–.3 .9 1.1 1.4 1.7 –2.2 .9 .8 .6 1.7 1.8 .6 –1.7 –1.5 –1.9 –2.7 1.0 1.2 1.5 –.6 .4 .6
1.5 .8 1.0 .7 1.4 –.1 .9 .5 1.8 2.1 1.8 1.0 –.4 –1.8 –1.9 2.6 1.4 .6 –.6 .1 1.5
1.0 .6 .4 2.1 –.1 1.2 .0 .1 .5 1.3 2.5 –2.0 .1 1.6 3.2 1.3 1.1 1.2 .2 .6 .8 2.1 2.1
.7 –.2 .3 –1.5 –1.3 1.0 2.7 1.3 2.4 –1.8 –2.1 1.1 .4 .4 .9 .8 .6 .6
–.3 –1.4 1.7 –.6 1.5 2.4 –.3 –.5 .7 2.0 .7 .8 1.0 .2
–1.3 .8 1.3 .2

AIRCRAFT : RMS O-B VECTOR (M/S) BETWEEN 70 AND 500 HPA FIGURE 7
JULY 1998
OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT

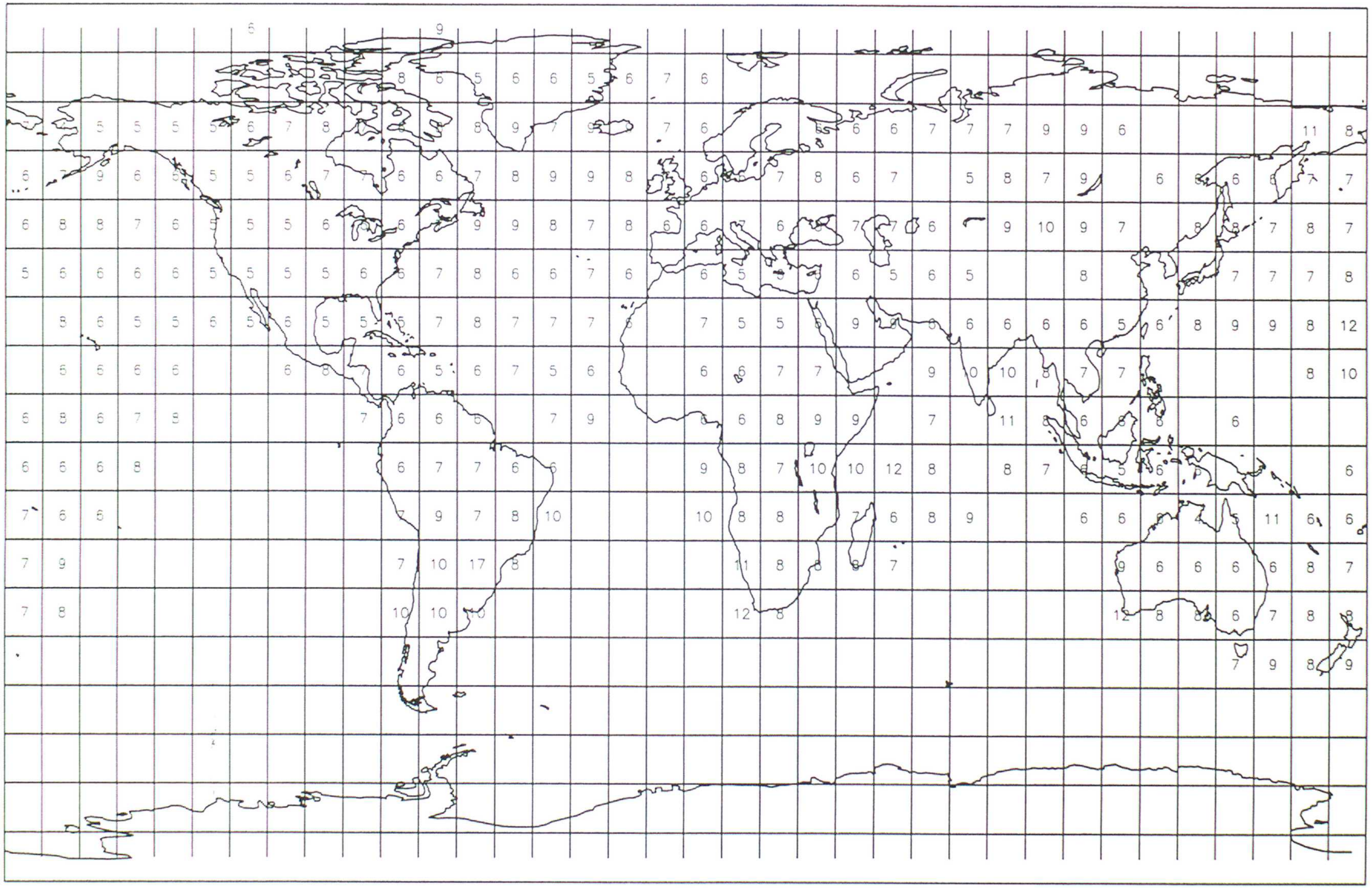

6 9
8 6 5 6 6 5 6 7 6
5 5 5 5 6 7 8 8 9 7 9 7 6 6 6 7 7 7 9 9 6 11 8
6 7 9 6 6 5 5 6 7 7 6 6 7 8 9 9 8 6 6 7 8 6 7 5 8 7 9 6 8 6 6 7 7
6 8 8 7 6 5 5 5 6 6 9 9 8 7 8 6 6 7 6 6 7 7 6 9 10 9 7 8 8 7 8 7
5 6 6 6 6 5 5 5 5 6 6 7 8 6 6 7 6 6 5 5 6 6 5 6 5 8 7 7 7 8
8 6 5 5 6 5 6 5 5 5 7 8 7 7 7 6 7 5 5 5 9 6 6 6 6 6 6 5 6 8 9 9 8 12
6 6 6 6 6 8 6 5 6 7 5 6 6 6 7 7 9 10 10 8 7 7 8 10
6 8 6 7 8 7 6 6 6 7 9 6 6 8 9 9 7 11 8 6 8 6 6
6 6 6 8 6 7 7 6 6 9 8 7 10 10 12 8 8 7 6 5 6 6
7 6 6 7 9 7 8 10 10 8 8 7 6 8 9 6 6 6 4 5 11 6 6
7 9 7 10 17 8 11 8 8 8 7 9 6 6 6 6 8 7
7 8 10 10 10 12 8 12 8 8 6 7 8 8
7 9 8 9

TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: July 1998

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 30.0 hPa
Element monitored		:GEOPOTENTIAL HEIGHT IN metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown duringperiod.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.

GROSS ERROR LIMITS :Defined in Appendix I.1

SELECTION CRITERIA : ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
40841	00	Z	150	30/ 57	16	0	42.1	-88.2	97.7	5
42027	00	Z	200	34/ 75	18	3	111.5	-97.0	147.8	8
42027	12	Z	100	34/ 75	10	1	141.9	-112.7	181.2	6
42101	00	Z	100	30/ 76	19	0	119.2	-31.5	123.3	6
42101	12	Z	150	30/ 76	18	1	105.8	105.6	149.4	6
42182	12	Z	150	29/ 77	24	1	76.6	91.0	119.0	4
42314	00	Z	150	27/ 95	10	1	100.1	100.4	141.8	7
42339	12	Z	200	26/ 73	16	1	97.1	54.6	111.4	7
42369	00	Z	150	27/ 81	15	0	102.0	17.4	103.5	6
42369	12	Z	150	27/ 81	16	1	105.8	104.6	148.7	7
42397	00	Z	70	27/ 88	20	0	117.6	103.9	156.9	6
42397	12	Z	150	27/ 88	23	1	92.9	64.3	113.0	8
42492	00	Z	150	26/ 85	28	0	108.5	-71.9	130.1	6
42647	12	Z	200	23/ 73	21	0	78.3	71.2	105.8	7
42667	12	Z	150	23/ 77	14	0	128.1	33.1	132.3	6
42701	00	Z	100	23/ 85	16	1	141.4	-3.9	141.5	5
42809	12	Z	200	23/ 88	28	0	63.9	56.5	85.3	7
42867	12	Z	150	21/ 79	22	0	65.1	63.6	91.0	6
43003	12	Z	150	19/ 73	13	4	76.5	151.6	169.8	7
43014	00	Z	150	20/ 75	9	12	64.9	-212.2	221.9	6
43014	12	Z	150	20/ 75	18	4	73.0	-134.4	153.0	4
43128	00	Z	100	17/ 78	17	0	122.8	-19.9	124.4	5
43128	12	Z	100	17/ 78	12	0	118.2	63.2	134.0	4
43185	12	Z	200	16/ 81	25	0	92.1	9.3	92.6	5
43192	00	Z	150	15/ 74	22	0	100.5	-11.6	101.2	4
43192	12	Z	150	15/ 74	26	0	98.8	46.6	109.2	5
43279	12	Z	150	13/ 80	26	0	82.0	71.4	108.7	4
43285	12	Z	150	13/ 75	18	0	74.1	131.2	150.7	7
43369	00	Z	100	8/ 73	20	0	98.4	-144.3	174.7	6
43371	00	Z	200	8/ 77	29	0	80.8	39.1	89.7	6
43371	12	Z	200	8/ 77	26	1	62.8	98.5	116.8	7
53463	00	Z	100	41/ 112	21	0	33.4	111.3	116.2	4
53463	12	Z	1000	41/ 112	30	0	16.1	28.2	32.5	4
53772	00	Z	150	38/ 113	29	0	29.7	114.0	117.8	6
53772	12	Z	100	38/ 113	30	0	34.9	131.6	136.2	4
53845	00	Z	1000	37/ 109	29	0	10.3	41.0	42.3	4
54161	00	Z	100	44/ 125	27	0	69.2	116.9	135.8	6
54161	12	Z	100	44/ 125	19	0	95.9	111.8	147.3	5
54337	00	Z	400	41/ 121	27	0	65.8	22.4	69.5	6
54497	00	Z	150	40/ 124	27	0	71.0	68.6	98.7	4
57749	00	Z	100	28/ 110	29	0	46.3	120.1	128.7	4
58203	00	Z	100	33/ 116	29	0	36.8	116.7	122.3	4
58424	00	Z	100	31/ 117	29	0	43.8	124.4	131.9	4
58457	00	Z	150	30/ 120	28	1	29.2	89.4	94.1	4
58633	00	Z	100	29/ 119	28	0	41.2	121.7	128.5	4
84628	12	Z	850	-12/ -77	25	0	6.6	-74.5	74.8	8
85934	12	Z	400	-53/ -71	29	0	51.3	52.6	73.5	4
89512	00	Z	1000	-71/ 12	11	14	16.7	81.2	82.9	10
89512	12	Z	850	-71/ 12	8	5	51.2	58.5	77.8	10
89664	00	Z	200	-78/ 167	8	2	88.9	108.3	140.1	7
97014	00	Z	50	2/ 125	10	0	75.9	-134.3	154.3	7

AVAILABILITY – TEMP – 500 HPA GEOPOTENTIAL – JULY 1998

ALL HOURS

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS – 1124

FIGURE 8

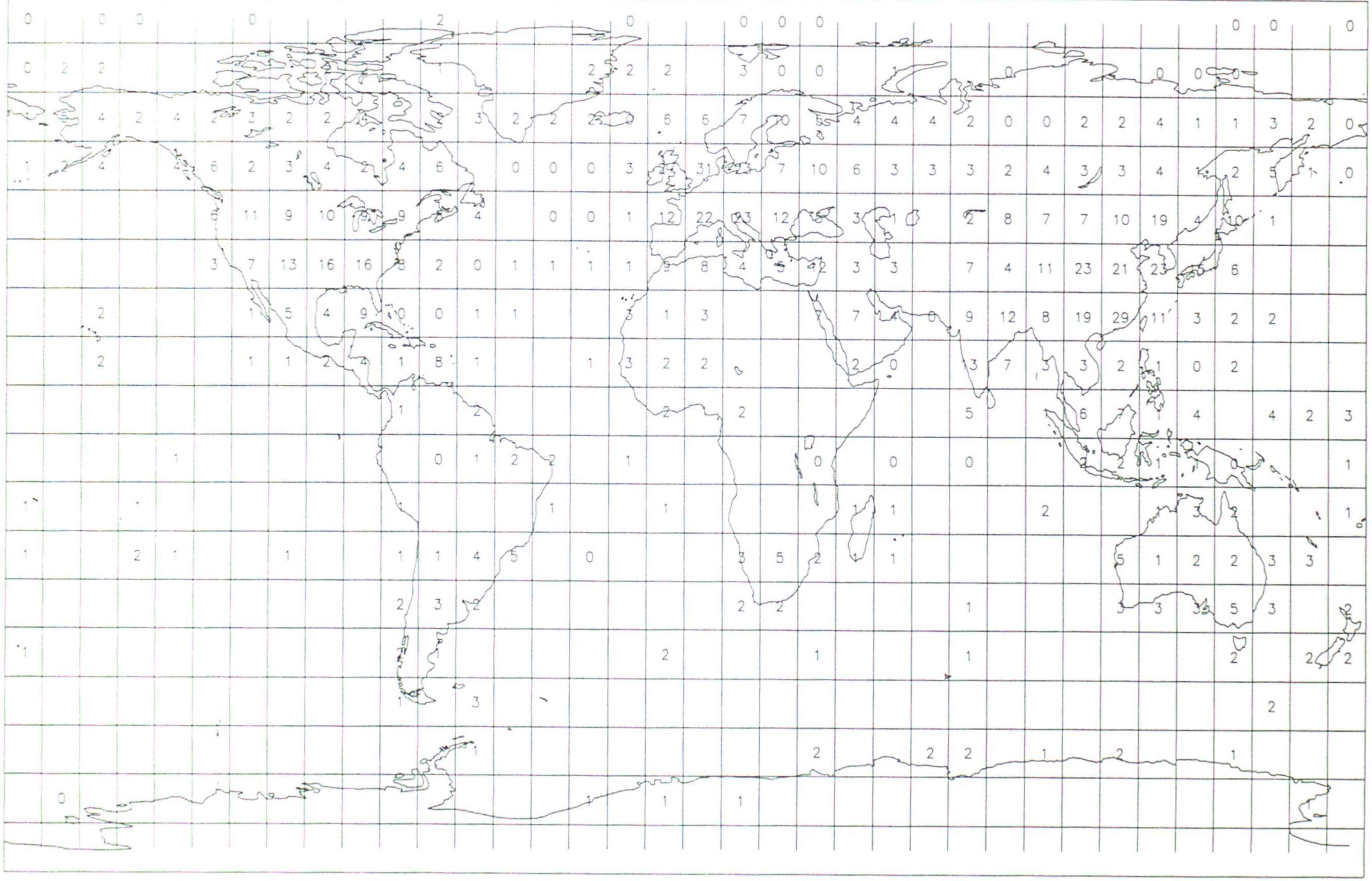


TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: July 1998

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from Bracknell global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 1000.0 - 100.0 hPa

Element monitored :VECTOR WIND in m s^{-1}

Parameters monitored

:NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:% REJ :Percentage of observations rejected by quality control at level shown during period.

:UBIAS,VBIAS :Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

:NUM LEVELS :Number of levels satisfying selection criteria.

GROSS ERROR LIMITS :Defined in Appendix I.2

SELECTION CRITERIA : ≥ 10 observations and ≥ 15 m s^{-1} RMS vector wind.

ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN

```
 WMO  OBS                                NUM    NUM     %
IDENT TIME ELM   LEV     LAT/LONG        OBS   GROSS   REJ   UBIAS   VBIAS    RMS    LEVELS

42361  12   V    400     26/  78          10      0     10    -3.7     4.5    15.3      1
43014  00   V    150     20/  75          21      0      0    10.9     0.5    15.7      1
48455  12   V    100     14/ 101          14      0      7    15.0     7.1    16.7      1
68263  12   V    200    -26/  28          11      1     33   -13.3     1.9    20.2      2
68442  12   V    250    -29/  26          11      0      9   -11.7     2.8    15.1      1

83612  00   V    200    -20/ -55          21      0     28    10.7     3.9    21.9      2
83612  12   V    150    -20/ -55          18      0     33    11.6     5.3    24.6      4
```

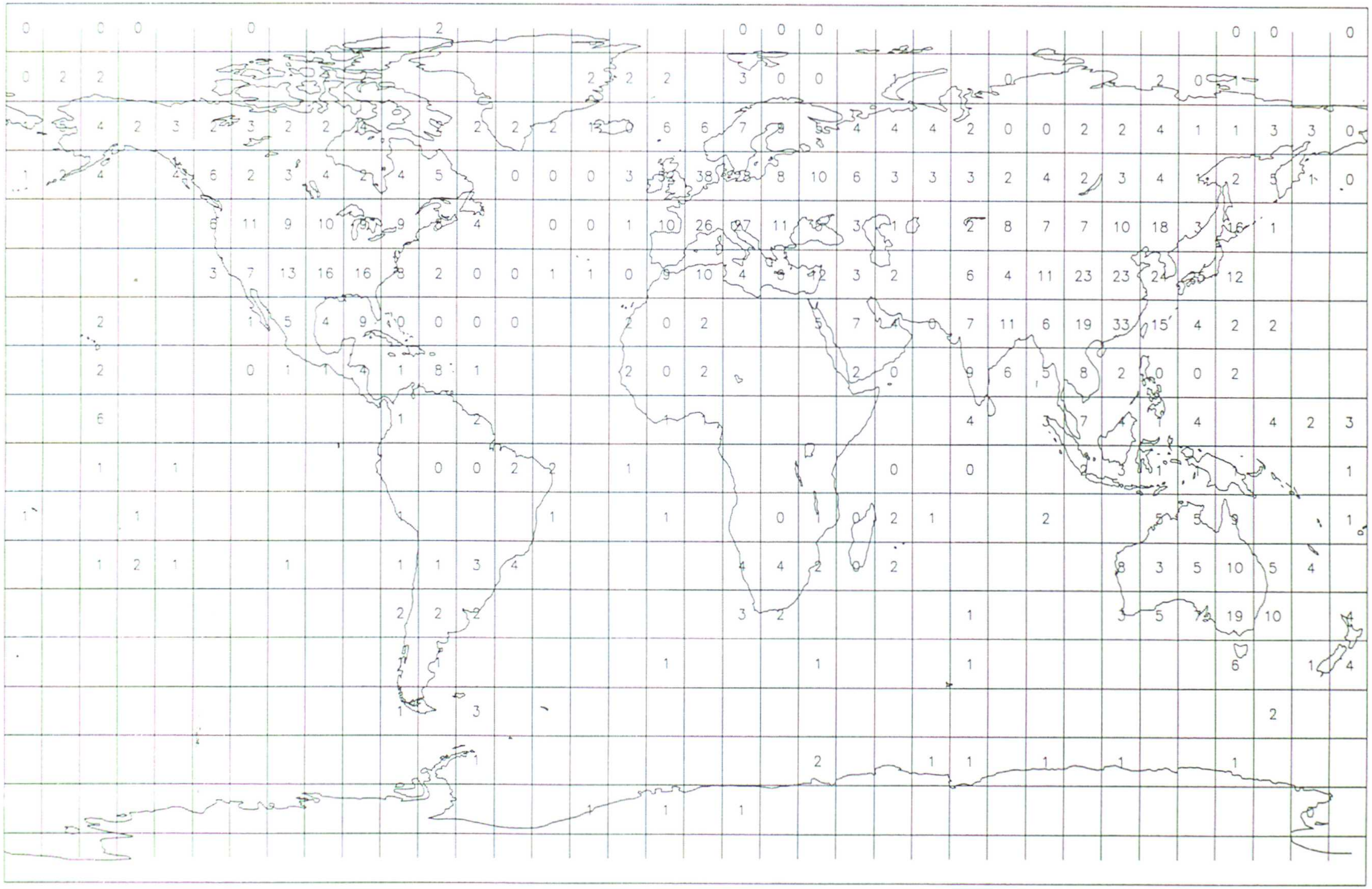
AVAILABILITY - TEMP/PILOT - 300 HPA WIND - JULY 1998

ALL HOURS

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS - 1241

FIGURE 9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0 2 2 2 2 2 3 0 0 1 0 2 0 1
4 2 3 2 3 2 2 13 2 2 2 13 6 6 7 8 55 4 4 4 2 0 0 2 2 4 1 1 3 3 0
1 2 4 4 6 2 3 4 2 4 5 0 0 0 3 5 38 23 8 10 6 3 3 3 2 4 2 3 4 1 2 5 1 0
8 11 9 10 19 9 4 0 0 1 10 26 27 11 3 3 1 2 8 7 7 10 18 3 16 1
3 7 13 16 16 8 2 0 0 1 1 0 9 10 4 6 42 3 2 6 4 11 23 23 24 5 12
2 1 5 4 9 10 0 0 0 2 0 2 5 7 4 0 7 11 6 19 33 15 4 2 2
2 0 1 1 4 1 8 1 2 0 2 2 0 9 6 5 8 2 0 0 2
6 1 2 1 4 3 7 4 1 4 4 2 3
1 1 0 0 2 2 1 0 0 3 1 1
1 1 1 1 1 0 1 0 2 1 2 5 5 9 1 1
1 2 1 1 1 1 3 4 4 4 2 0 2 8 3 5 10 5 4
2 2 2 3 2 1 3 5 72 19 10 4
1 1 1 1 6 1 4
1 3 2
1 2 1 1 1 1 1
1 1 1

TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: July 1998

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 500.0 - 150.0 hPa
Element monitored		:WIND DIRECTION in degrees
Parameters monitored		
	:NUM OBS	:Average number of observations at all levels.
	:BIAS	:Mean difference of observations from background values from all levels.
	:MAX SPREAD	:(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels
	:SD	:SD of difference of observations from background values at all levels.
SELECTION CRITERIA	:NUM OBS ≥ 5, and ABSOLUTE BIAS ≥ 10°, with SD < 30°, and MAX SPREAD < 10°	

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
UBNR	12	DD	51/ 152	6	-11.8	9.2	19.9
17280	00	DD	38/ 40	24	-11.2	6.1	10.7
31168	12	DD	56/ 138	14	10.4	5.4	15.5
42339	00	DD	26/ 73	10	17.8	8.2	20.6
48407	00	DD	15/ 105	17	-12.6	7.3	21.1
48568	00	DD	7/ 101	24	15.3	3.5	18.2
55299	00	DD	31/ 92	15	-10.6	9.0	25.2
56080	12	DD	35/ 103	26	-10.7	9.3	21.8
56294	12	DD	31/ 104	17	-13.5	4.2	21.8
62337	00	DD	31/ 34	17	-19.1	5.6	15.2
72214	00	DD	30/ -84	5	-10.8	8.0	17.1
76644	12	DD	21/ -90	8	-14.3	7.0	17.0
80001	12	DD	13/ -82	8	12.3	8.4	29.5

MONITORING OF SATELLITE WINDS

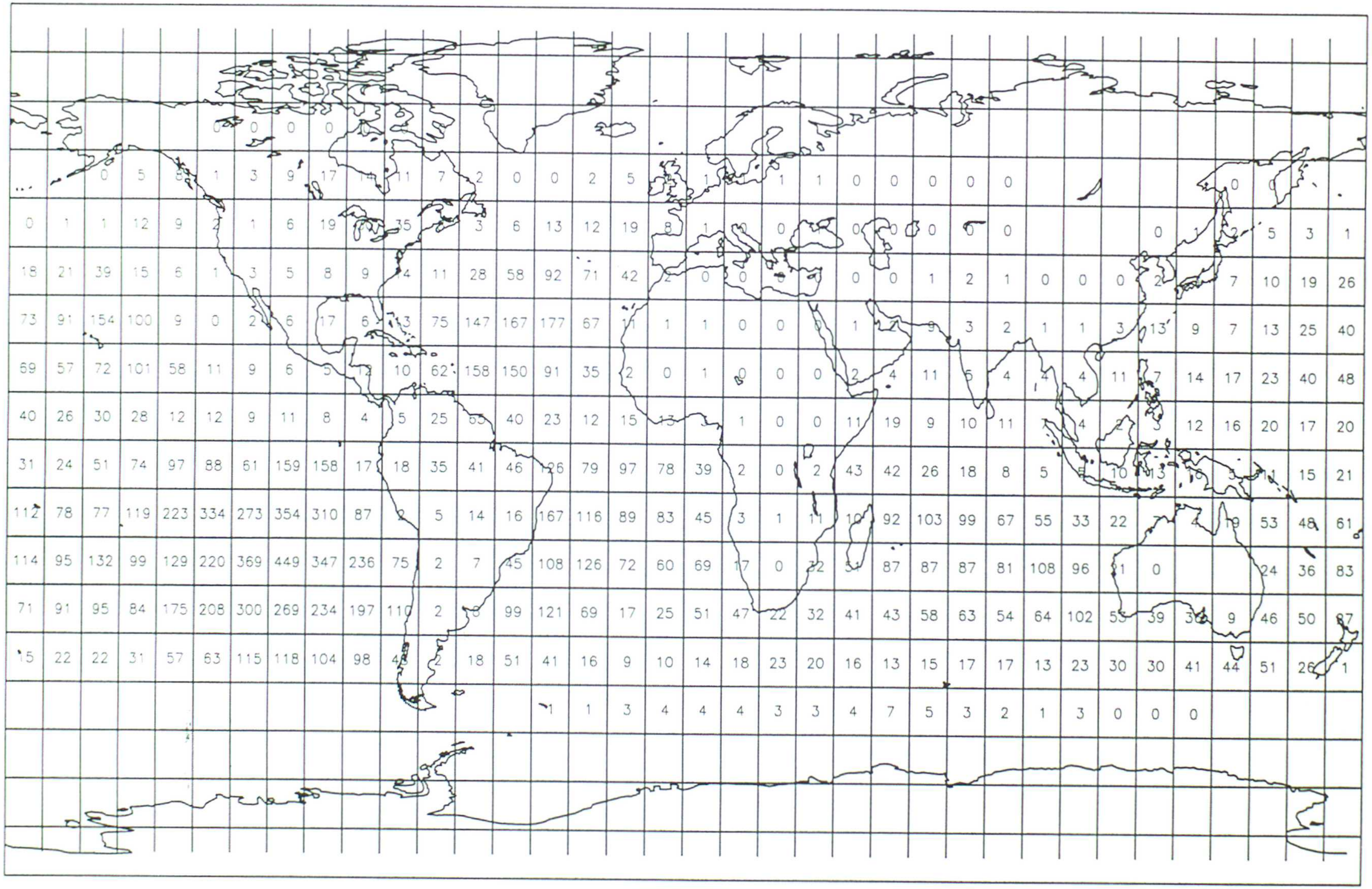
MONITORING CENTRE: BRACKNELL

MONTH: July 1998

Monitoring procedures

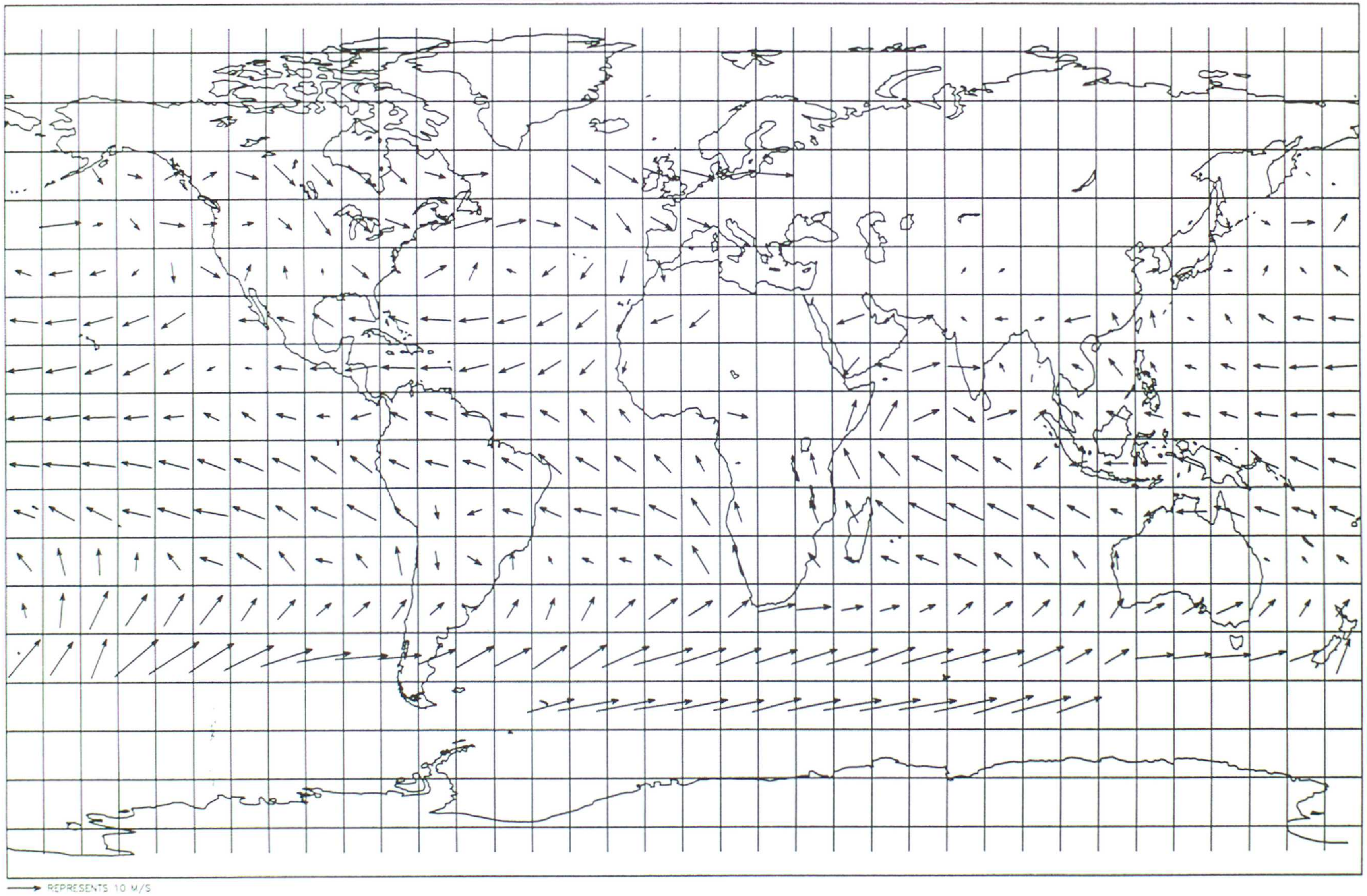
Period	:One calendar month.
Data monitored	:Reports from GOES, METEOSAT, GMS, INSAT.
Standard of comparison	:Background field from Bracknell global model.
Selection Criteria	:number of observations > 10.
Data Extracted	:Layer 701 - 1000 hPa 401 - 700 hPa 101 - 400 hPa
	:Mean wind
	:Mean observation minus background vector wind differences
	:Mean observation minus background speed differences
	:RMS of observation minus background vector differences

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 701 AND 1000 HPA FIGURE 10
JULY 1998


0 0 0 0 0 0
0 5 8 1 3 9 17 14 11 7 2 0 0 2 5 1 1 1 1 0 0 0 0 0 0 0
0 1 1 12 9 2 1 6 19 20 35 3 6 13 12 19 8 1 0 0 1 0 0 0 0 0 0 1 2 5 3 1
18 21 39 15 6 1 3 5 8 9 14 11 28 58 92 71 42 2 0 0 0 0 0 0 1 2 1 0 0 0 2 7 10 19 26
73 91 154 100 9 0 2 6 17 6 13 75 147 167 177 67 11 1 1 0 0 0 1 2 9 3 2 1 1 3 13 9 7 13 25 40
69 57 72 101 58 11 9 6 5 12 10 62 158 150 91 35 2 0 1 0 0 0 2 4 11 5 4 4 4 11 7 14 17 23 40 48
40 26 30 28 12 12 9 11 8 4 5 25 65 40 23 12 15 13 3 1 0 0 11 19 9 10 11 7 4 2 3 12 16 20 17 20
31 24 51 74 97 88 61 159 158 17 18 35 41 46 126 79 97 78 39 2 0 2 43 42 26 18 8 5 5 10 13 16 3 11 15 21
112 78 77 119 223 334 273 354 310 87 2 5 14 16 167 116 89 83 45 3 1 11 10 92 103 99 67 55 33 22 7 4 19 53 48 61
114 95 132 99 129 220 369 449 347 236 75 2 7 45 108 126 72 60 69 17 0 32 51 87 87 87 81 108 96 31 0 24 36 83
71 91 95 84 175 208 300 269 234 197 110 2 8 99 121 69 17 25 51 47 22 32 41 43 58 63 54 64 102 55 39 36 9 46 50 87
15 22 22 31 57 63 115 118 104 98 48 2 18 51 41 16 9 10 14 18 23 20 16 13 15 17 17 13 23 30 30 41 44 51 26 1
1 1 3 4 4 4 3 3 4 7 5 3 2 1 3 0 0 0

SATOB VECTOR MEAN WINDS BETWEEN 701–1000 HPA
JULY 1998
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 11


REPRESENTS 10 M/S

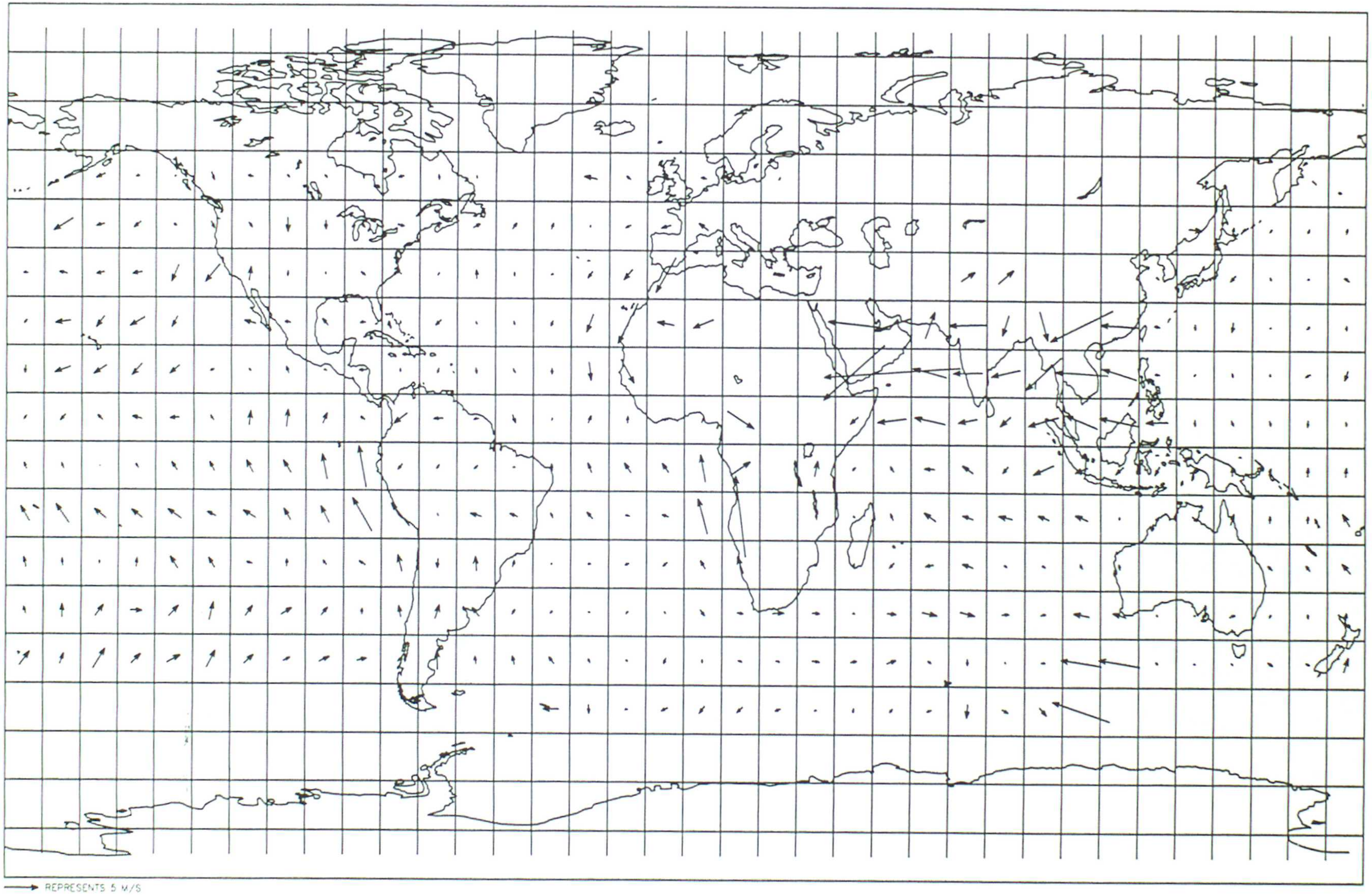
SATOB O–B VECTOR WIND DIFFERENCES BETWEEN 701–1000 HPA

JULY 1998

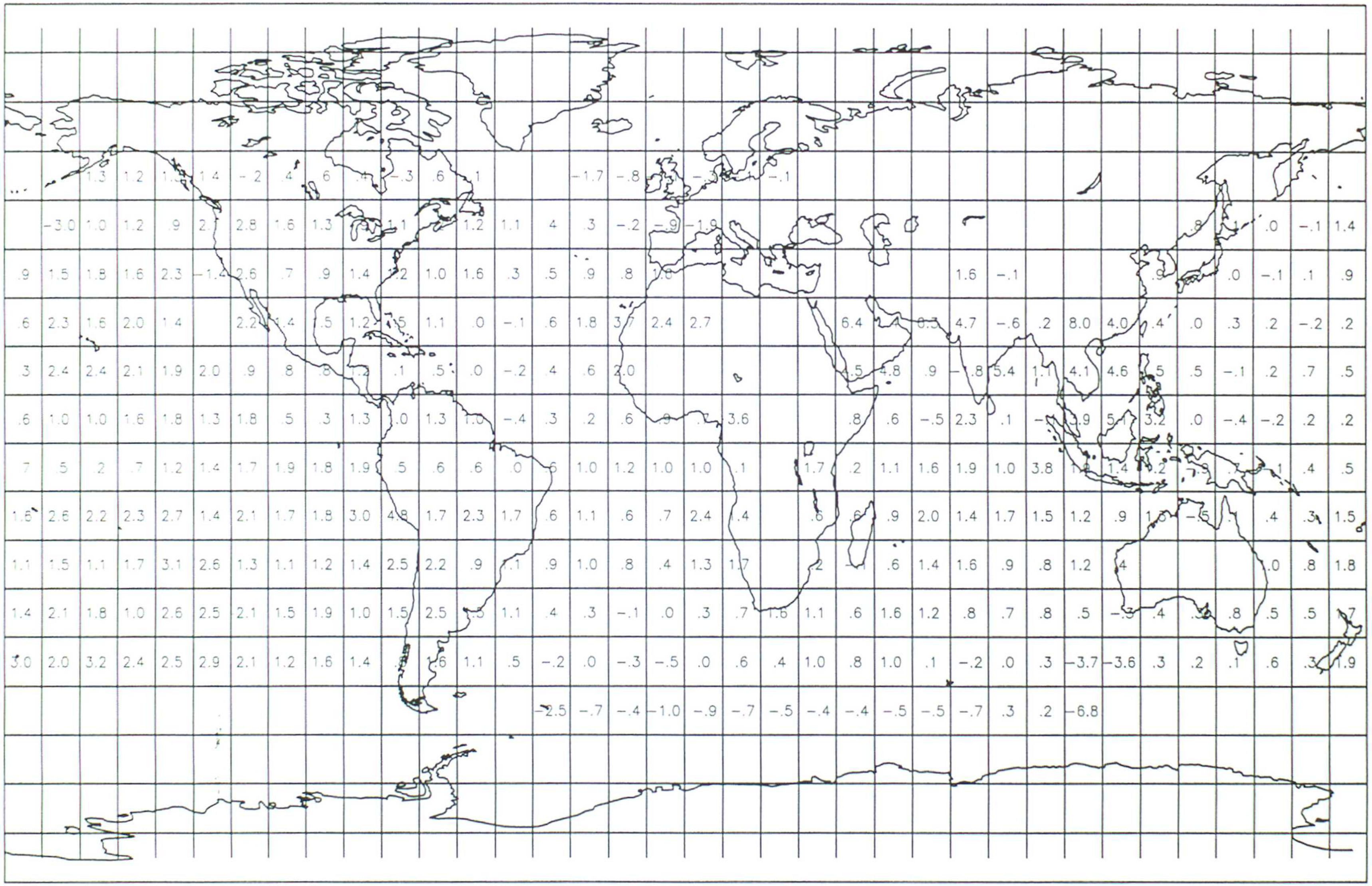
ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 12


REPRESENTS 5 M/S

SATOBS : MEAN O–B SPEED DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 13
JULY 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT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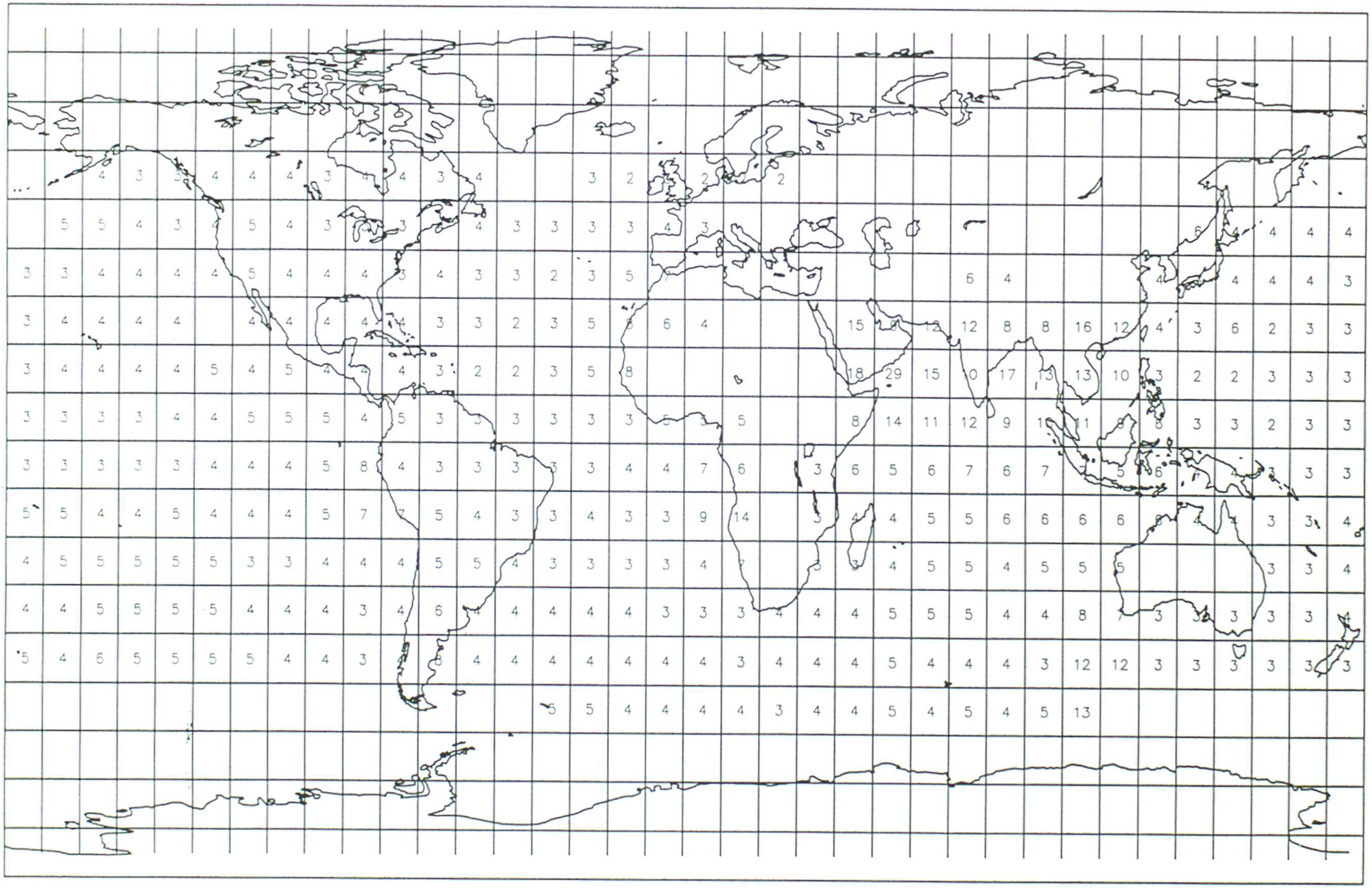
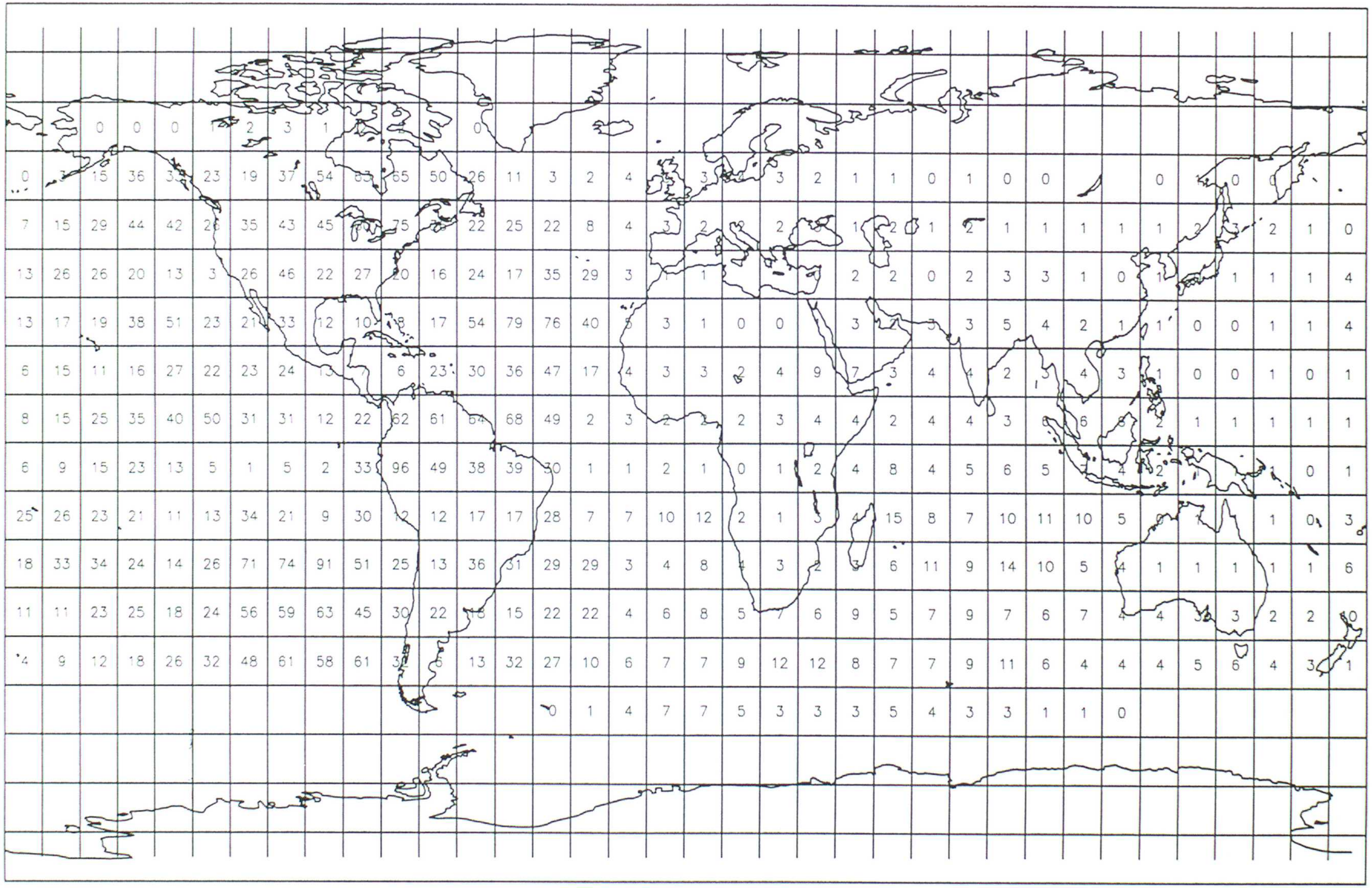
.9 1.5 1.8 1.6 2.3 –1.4 2.6 .7 .9 1.4 1.2 1.0 1.6 .3 .5 .9 .8 1.6 –.1 .9 .0 –.1 .1 .9
.6 2.3 1.6 2.0 1.4 2.2 1.4 .5 1.2 .5 1.1 .0 –.1 .6 1.8 3.7 2.4 2.7 6.4 .4 4.7 –.6 .2 8.0 4.0 .4 .0 .3 .2 –.2 .2
.3 2.4 2.4 2.1 1.9 2.0 .9 .8 .8 1.2 .1 .5 .0 –.2 .4 .6 2.0 4.5 4.8 .9 .8 5.4 1.1 4.1 4.6 .5 .5 –.1 .2 .7 .5
.6 1.0 1.0 1.6 1.8 1.3 1.8 .5 .3 1.3 .0 1.3 1.0 –.4 .3 .2 .6 .9 3.6 .8 .6 –.5 2.3 .1 3.9 5.1 3.2 .0 –.4 –.2 .2 .2
.7 .5 .2 .7 1.2 1.4 1.7 1.9 1.8 1.9 .5 .6 .6 .0 .6 1.0 1.2 1.0 1.0 .1 1.7 .2 1.1 1.6 1.9 1.0 3.8 1.4 .2 .1 .4 .5
1.6 2.6 2.2 2.3 2.7 1.4 2.1 1.7 1.8 3.0 4.8 1.7 2.3 1.7 .6 1.1 .6 .7 2.4 1.4 .6 .9 2.0 1.4 1.7 1.5 1.2 .9 –.5 .4 .3 1.5
1.1 1.5 1.1 1.7 3.1 2.6 1.3 1.1 1.2 1.4 2.5 2.2 .9 1.1 .9 1.0 .8 .4 1.3 1.7 .2 .6 1.4 1.6 .9 .8 1.2 .4 .0 .8 1.8
1.4 2.1 1.8 1.0 2.6 2.5 2.1 1.5 1.9 1.0 1.5 2.5 1.1 .4 .3 –.1 .0 .3 .7 1.6 1.1 .6 1.6 1.2 .8 .7 .8 .5 .4 .8 .5 .5 .7
3.0 2.0 3.2 2.4 2.5 2.9 2.1 1.2 1.6 1.4 1.6 1.1 .5 –.2 .0 –.3 –.5 .0 .6 .4 1.0 .8 1.0 .1 –.2 .0 .3 –3.7 –3.6 .3 .2 .1 .6 .3 1.9
–2.5 –.7 –.4 –1.0 –.9 –.7 –.5 –.4 –.4 –.5 –.5 –.7 .3 .2 –6.8

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 14
JULY 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT



AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 401 AND 700 HPA FIGURE 15
JULY 1998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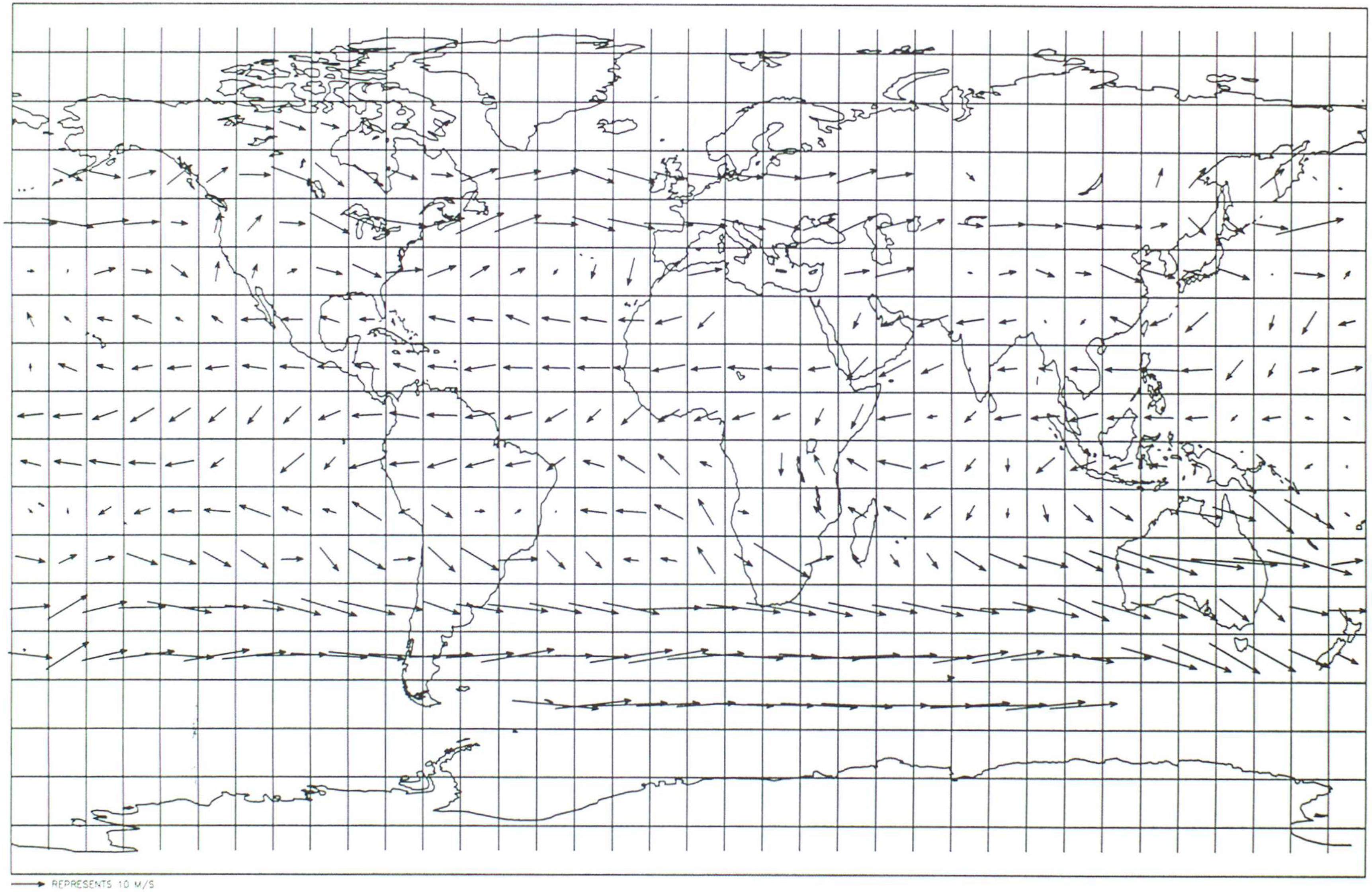
7 15 29 44 42 26 35 43 45 60 75 22 25 22 8 4 3 2 2 1 2 1 2 1 1 1 1 1 2 3 2 1 0
13 26 26 20 13 3 26 46 22 27 20 16 24 17 35 29 3 1 1 2 2 0 2 3 3 1 0 1 1 1 1 4
13 17 19 38 51 23 21 33 12 10 18 17 54 79 76 40 5 3 1 0 0 3 2 3 3 5 4 2 1 1 0 0 1 1 4
6 15 11 16 27 22 23 24 13 7 6 23 30 36 47 17 4 3 3 2 4 9 7 3 4 4 2 3 4 3 1 0 0 1 0 1
8 15 25 35 40 50 31 31 12 22 62 61 64 68 49 2 3 2 2 2 3 4 4 2 4 4 3 6 6 8 2 1 1 1 1 1
6 9 15 23 13 5 1 5 2 33 96 49 38 39 30 1 1 2 1 0 1 2 4 8 4 5 6 5 7 4 2 1 1 1 0 1
25 26 23 21 11 13 34 21 9 30 12 12 17 17 28 7 7 10 12 2 1 3 4 15 8 7 10 11 10 5 0 1 1 0 3
18 33 34 24 14 26 71 74 91 51 25 13 36 31 29 29 3 4 8 4 3 2 3 6 11 9 14 10 5 4 1 1 1 1 1 6
11 11 23 25 18 24 56 59 63 45 30 22 18 15 22 22 4 6 8 5 7 6 9 5 7 9 7 6 7 4 4 3 3 2 2 10
4 9 12 18 26 32 48 61 58 61 32 6 13 32 27 10 6 7 7 9 12 12 8 7 7 9 11 6 4 4 4 5 6 4 3 1
0 1 4 7 7 5 3 3 3 5 4 3 3 1 1 0

SATOB VECTOR MEAN WINDS BETWEEN 401-700 HPA
JULY 1998
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 16


REPRESENTS 10 M/S

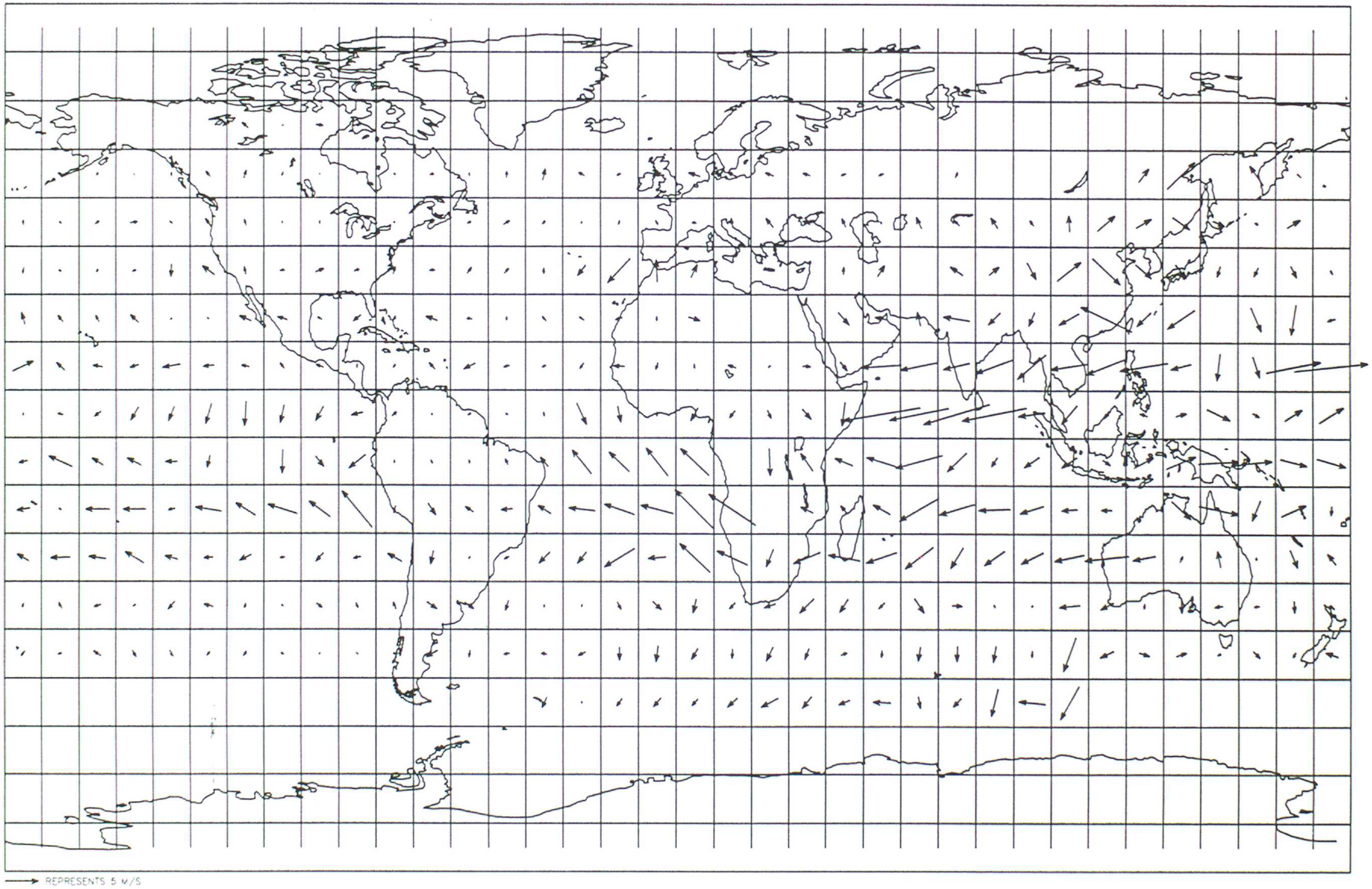
SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 401-700 HPA

FIGURE 17

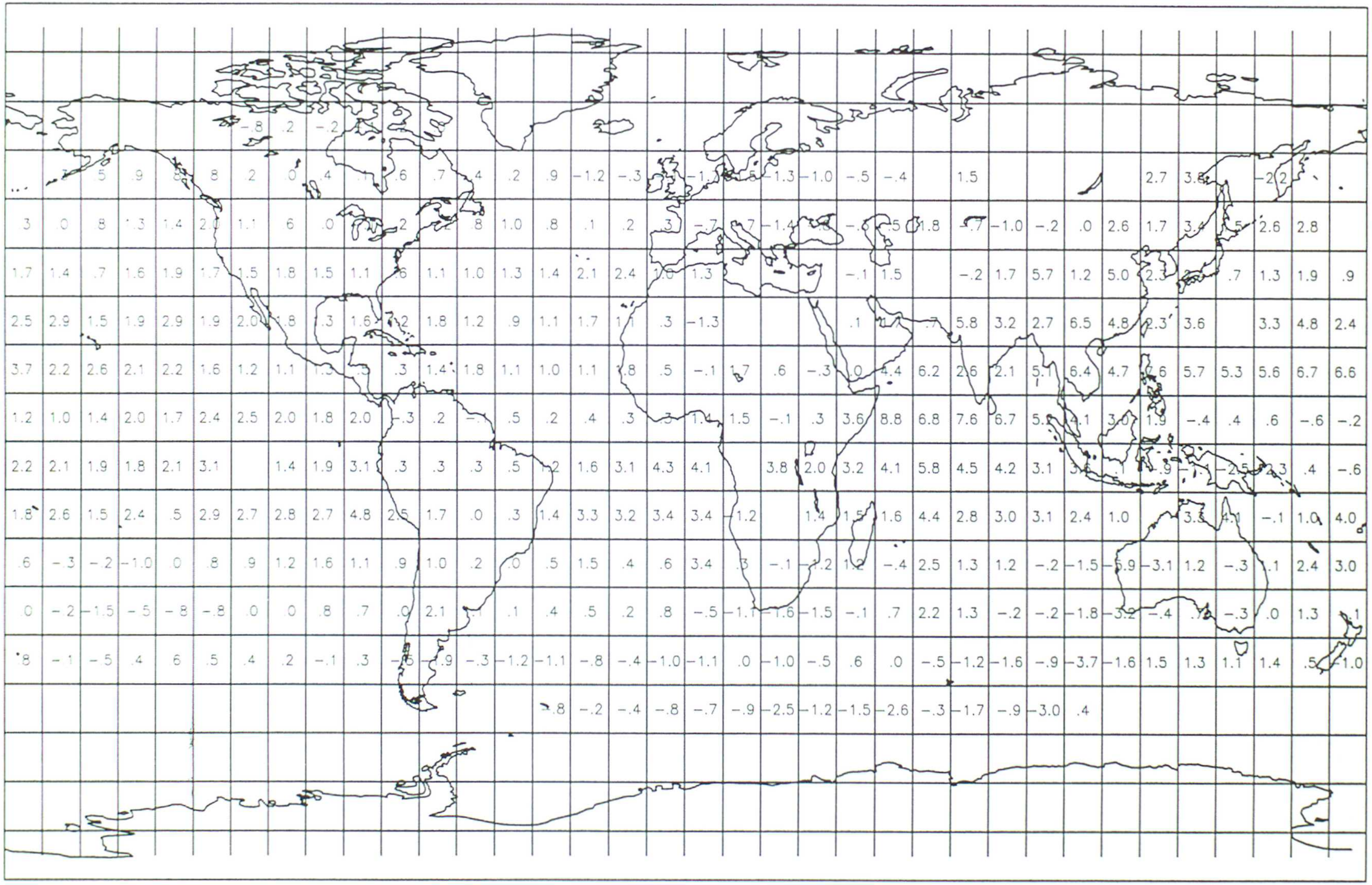
JULY 1998

ALL OBSERVATIONS

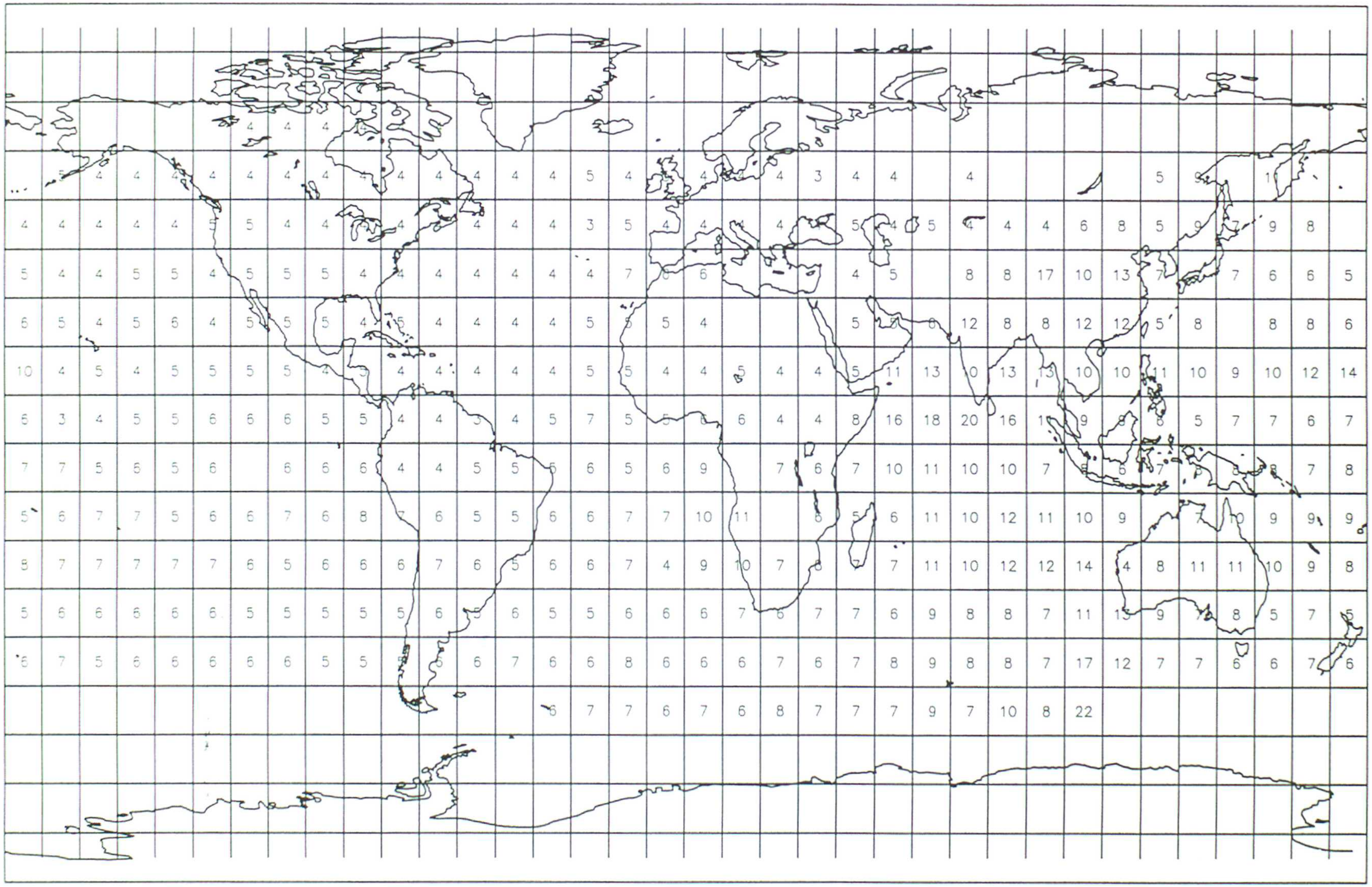
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT


REPRESENTS 5 M/S

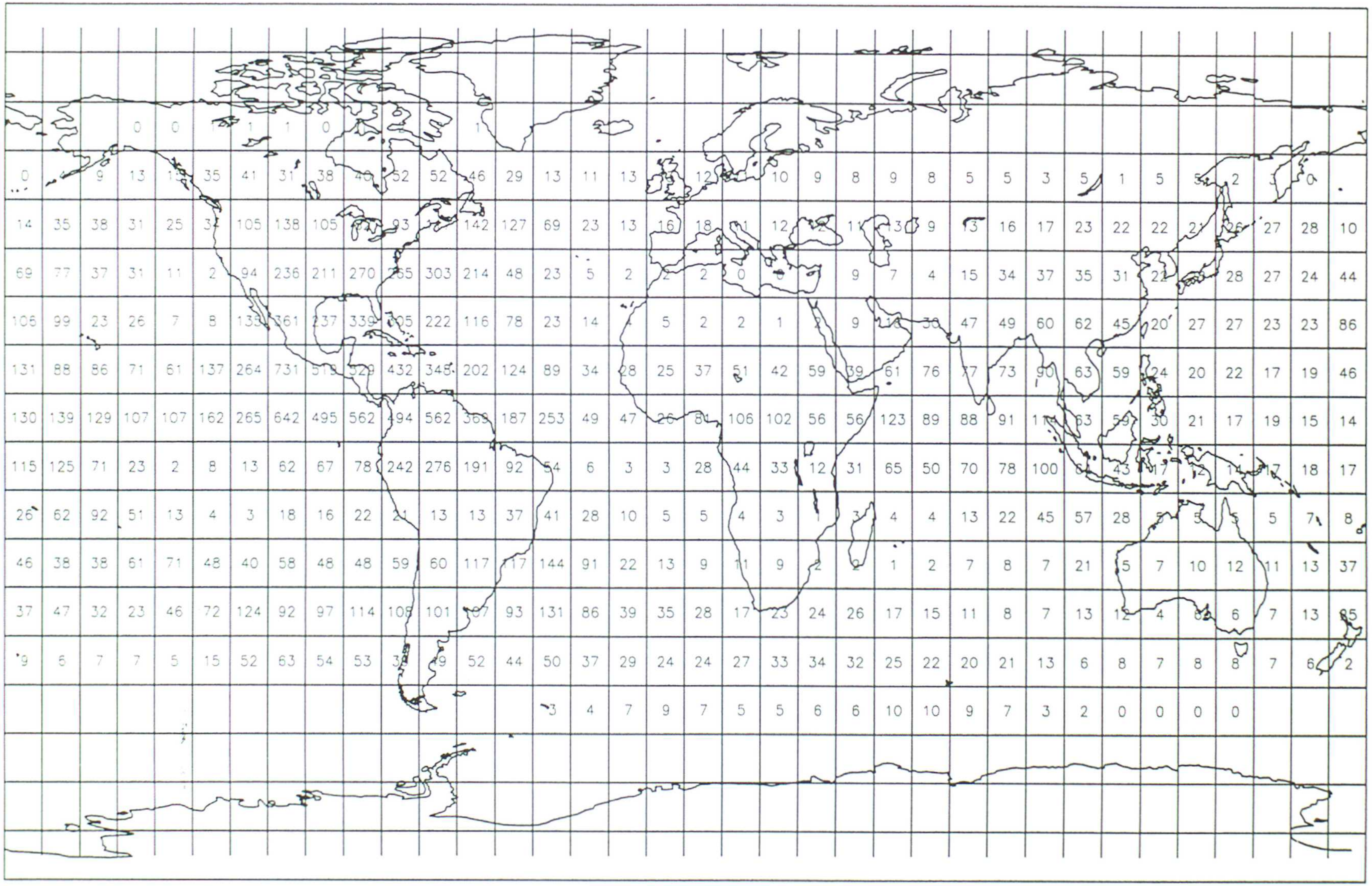
SATOBS : MEAN O-B SPEED DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 18
JULY 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT



SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 19
JULY 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT

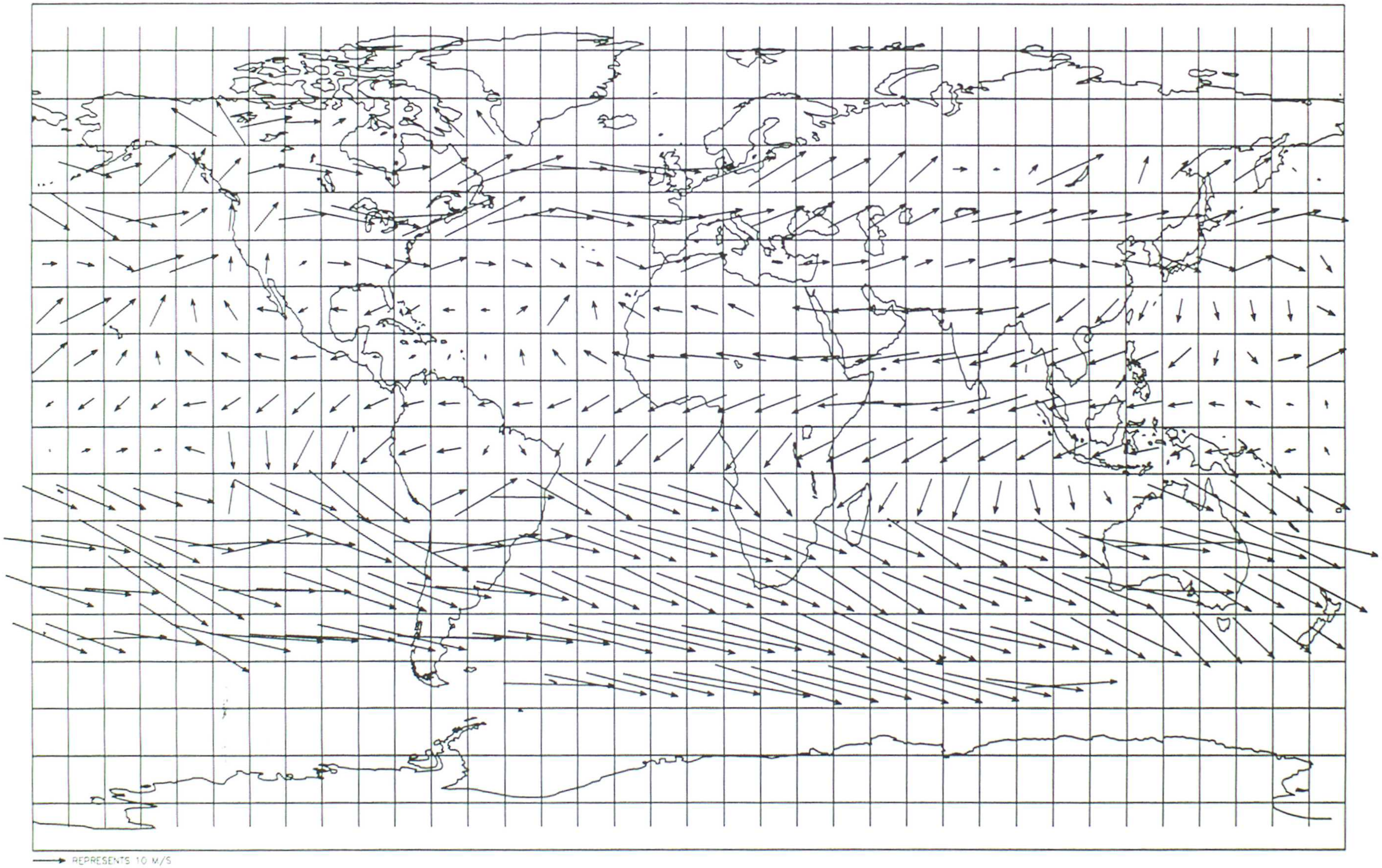

4 4 4
5 4 4 4 4 4 4 4 4 4 4 4 4 4 5 4 4 4 4 3 4 4 4 5 9 1
4 4 4 4 4 5 5 4 4 4 4 4 4 4 3 5 4 4 4 4 5 4 5 4 4 4 6 8 5 9 7 9 8
5 4 4 5 5 4 5 5 5 4 4 4 4 4 4 4 7 6 6 4 5 8 8 17 10 13 7 7 6 6 5
6 5 4 5 6 4 5 5 5 4 5 4 4 4 4 5 5 5 4 5 5 6 12 8 8 12 12 5 8 8 8 6
10 4 5 4 5 5 5 5 4 5 4 4 4 4 4 5 5 4 4 5 4 4 5 11 13 0 13 13 10 10 11 10 9 10 12 14
6 3 4 5 5 6 6 6 5 5 4 4 3 4 5 7 5 5 6 6 4 4 8 16 18 20 16 1 9 8 6 5 7 7 6 7
7 7 5 6 5 6 6 6 6 4 4 5 5 5 6 5 6 9 7 6 7 10 11 10 10 7 8 6 7 8 8 8 7 8
5 6 7 7 5 6 6 7 6 8 7 6 5 5 6 6 7 7 10 11 6 5 6 11 10 12 11 10 9 7 0 9 9 9
8 7 7 7 7 7 6 5 6 6 6 7 6 5 6 6 7 4 9 10 7 8 7 7 11 10 12 12 14 4 8 11 11 10 9 8
5 6 6 6 6 6 5 5 5 5 5 6 5 6 5 5 6 6 6 7 6 7 7 6 9 8 8 7 11 13 9 7 8 5 7 5
6 7 5 6 6 6 6 6 5 5 5 5 6 7 6 6 8 6 6 6 7 6 7 8 9 8 8 7 17 12 7 7 6 6 7 6
6 7 7 6 7 6 8 7 7 7 9 7 10 8 22

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 101 AND 400 HPA FIGURE 20
JULY 1998


0 0 1 1 1 0 [illegible] [illegible] 1
0 [illegible] 9 13 13 35 41 31 38 40 52 52 46 29 13 11 13 [illegible] 12 [illegible] 10 9 8 9 8 5 5 3 5 1 5 5 2 3 0
14 35 38 31 25 34 105 138 105 [illegible] 93 [illegible] 142 127 69 23 13 16 18 11 12 [illegible] 11 13 9 13 16 17 23 22 22 21 26 27 28 10
69 77 37 31 11 2 94 236 211 270 265 303 214 48 23 5 2 2 2 0 0 [illegible] 9 7 4 15 34 37 35 31 22 [illegible] 28 27 24 44
106 99 23 26 7 8 135 361 237 339 305 222 116 78 23 14 4 5 2 2 1 2 9 16 30 47 49 60 62 45 20 27 27 23 23 86
131 88 86 71 61 137 264 731 513 329 432 348 202 124 89 34 28 25 37 51 42 59 39 61 76 77 73 90 63 59 24 20 22 17 19 46
130 139 129 107 107 162 265 642 495 562 494 562 369 187 253 49 47 26 81 106 102 56 56 123 89 88 91 114 63 59 30 21 17 19 15 14
115 125 71 23 2 8 13 62 67 78 242 276 191 92 54 6 3 3 28 44 33 12 31 65 50 70 78 100 64 43 17 12 14 17 18 17
26 62 92 51 13 4 3 18 16 22 21 13 13 37 41 28 10 5 5 4 3 1 3 4 4 13 22 45 57 28 5 5 5 5 7 8
46 38 38 61 71 48 40 58 48 48 59 60 117 117 144 91 22 13 9 11 9 2 2 1 2 7 8 7 21 5 7 10 12 11 13 37
37 47 32 23 46 72 124 92 97 114 108 101 107 93 131 86 39 35 28 17 23 24 26 17 15 11 8 7 13 12 4 6 6 7 13 35
9 6 7 7 5 15 52 63 54 53 39 49 52 44 50 37 29 24 24 27 33 34 32 25 22 20 21 13 6 8 7 8 8 7 6 2
3 4 7 9 7 5 5 6 6 10 10 9 7 3 2 0 0 0 0

SATOB VECTOR MEAN WINDS BETWEEN 101–400 HPA
JULY 1998
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 21


REPRESENTS 10 M/S

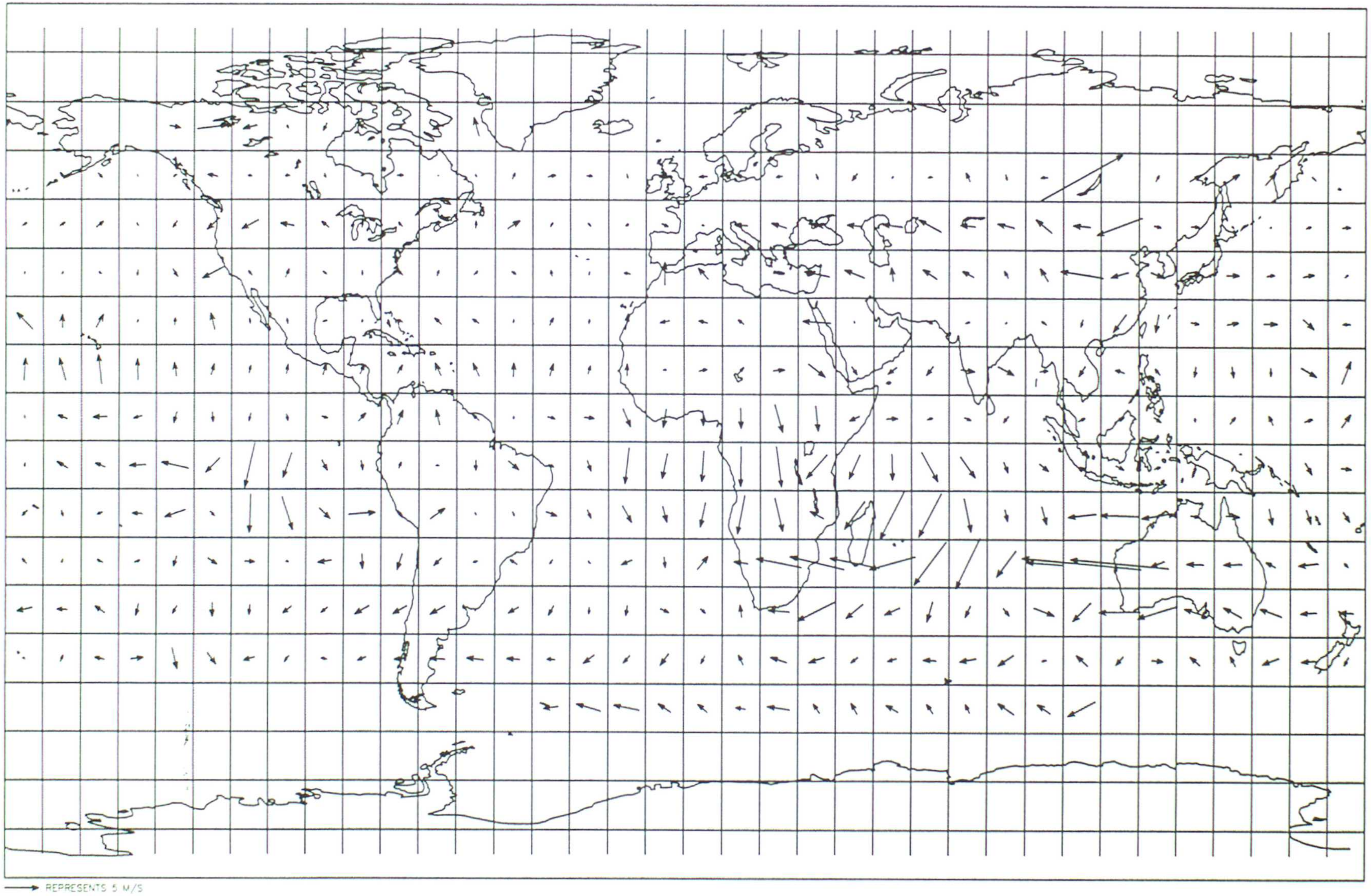
SATOB O–B VECTOR WIND DIFFERENCES BETWEEN 101–400 HPA

FIGURE 22

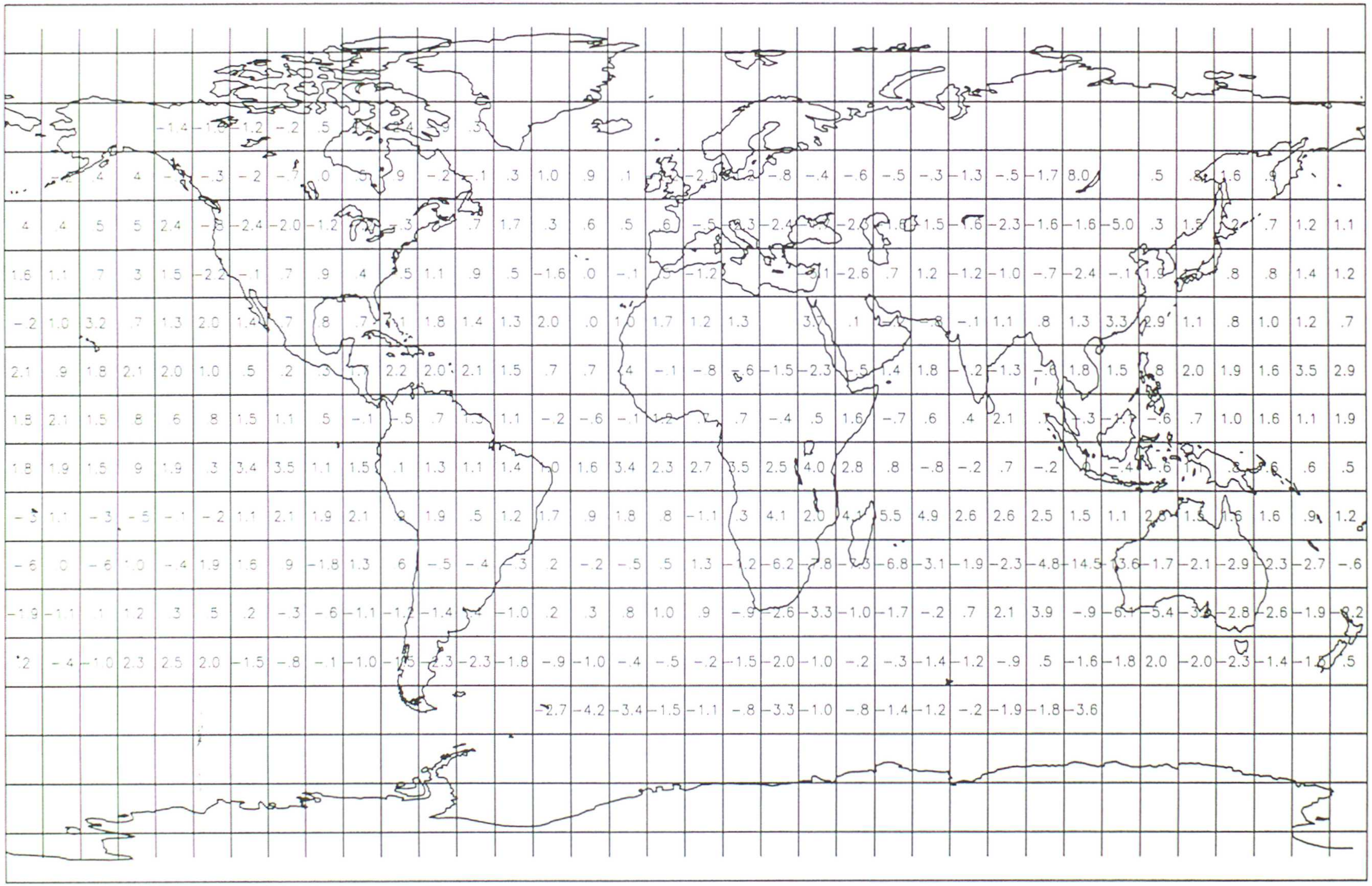
JULY 1998

ALL OBSERVATIONS

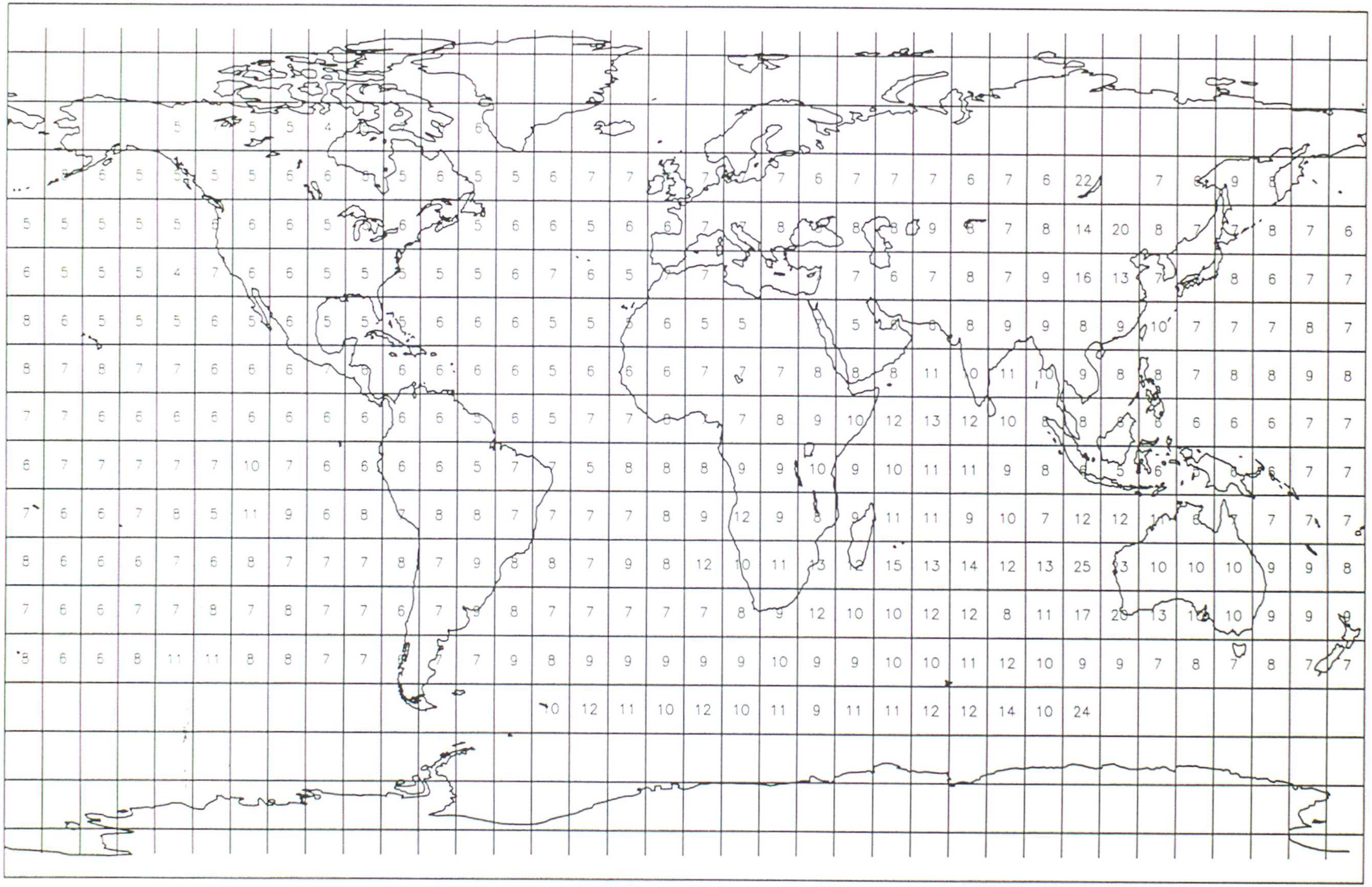
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT


REPRESENTS 5 M/S

SATOBS : MEAN O-B SPEED DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 23
JULY 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT



SATOBS : RMS O–B VECTOR DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 24
JULY 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT



MONITORING OF SATELLITE TEMPERATURES

MONITORING CENTRE: BRACKNELL

MONTH: July 1998

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from NOAA-11, NOAA-14 500 km.
Standard of comparison	:Background field from Bracknell global model.
Selection Criteria	:All SATEM soundings where number of observations > 30.
Data Extracted	:Layer: 850 - 1000 hPa 100 - 300 hPa 30 - 50 hPa
	:Mean observation minus background temperature differences

NO DATA AVAILABLE

TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
DATA TYPE:- DRIFTER
MONITORING CENTRE: BRACKNELL
MONTH: July 1998

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for drifting buoy.
Area monitored		:10°N - 80°N, 85°W - 0°W
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:All hours combined.
Elements monitored		:Mean sea-level pressure (hPa) :Wind speed (m s^{-1}) :Wind direction (degrees)
Parameters monitored		
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. A positive bias indicates the observation is veered to the background**
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors
GROSS ERROR LIMITS	:15 hPa (pressure) :25 m s^{-1} (Vector Wind)	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
13502	14.9	-41.6	ALL	P	SUR	236	0	0	0.9	0.5	1.0
13503	19.5	-38.2	ALL	P	SUR	258	0	0	1.0	-0.3	1.1
13605	42.9	-40.1	ALL	P	SUR	1	0	0	0.0	-1.5	1.5
13906	27.1	-50.3	ALL	P	SUR	232	0	0	0.8	-0.1	0.8
13912	18.0	-66.4	ALL	P	SUR	18	0	0	1.3	-1.5	2.0
13913	14.7	-58.9	ALL	P	SUR	223	0	0	1.1	-0.2	1.1
41502	21.6	-43.9	ALL	P	SUR	212	0	0	0.9	0.4	1.0
41503	16.5	-53.8	ALL	P	SUR	244	0	0	0.9	0.3	1.0
41506	15.9	-61.6	ALL	P	SUR	200	0	0	1.5	1.2	1.9
41520	20.4	-44.2	ALL	P	SUR	231	0	0	0.9	0.9	1.3
41521	22.1	-55.4	ALL	P	SUR	268	0	0	0.9	0.3	0.9
41597	32.8	-21.7	ALL	P	SUR	558	0	0	0.8	0.1	0.8
41598	22.9	-42.5	ALL	P	SUR	236	9	4	1.0	0.1	1.0
41599	23.0	-37.5	ALL	P	SUR	185	20	11	0.8	-0.7	1.0
41600	12.5	-37.6	ALL	P	SUR	52	1	2	0.7	-0.3	0.8
41601	18.0	-42.8	ALL	P	SUR	255	0	0	1.0	1.0	1.4
41633	12.5	-47.9	ALL	P	SUR	153	6	4	1.1	0.2	1.1
41634	12.6	-52.9	ALL	P	SUR	182	4	2	0.9	0.5	1.1
41635	17.6	-52.3	ALL	P	SUR	197	14	7	1.4	1.5	2.1
41636	17.7	-47.9	ALL	P	SUR	163	21	13	1.3	-0.1	1.3
41637	22.3	-47.8	ALL	P	SUR	58	7	12	0.8	-0.1	0.8
41638	22.2	-52.9	ALL	P	SUR	140	2	1	0.9	0.0	0.9
41924	22.8	-51.3	ALL	P	SUR	194	0	0	0.9	-2.0	2.2
42522	27.2	-84.3	ALL	P	SUR	79	0	0	0.8	0.6	1.0
42534	45.4	-36.9	ALL	P	SUR	9	0	0	0.2	0.0	0.2
42565901	40.0	-20.0	ALL	P	SUR	1	0	0	0.0	1.0	1.0
42581	27.5	-84.4	ALL	P	SUR	22	0	0	0.7	0.7	1.0
44601	54.1	-48.3	ALL	P	SUR	793	88	11	1.0	0.3	1.0
44602	52.6	-38.7	ALL	P	SUR	742	38	5	1.0	0.5	1.1
44603	55.3	-47.4	ALL	P	SUR	898	0	0	0.9	-0.1	0.9
44604	48.9	-40.4	ALL	P	SUR	686	0	0	1.0	0.4	1.1
44606	51.5	-47.6	ALL	P	SUR	1051	0	0	1.0	0.1	1.0
44609	59.0	-20.9	ALL	P	SUR	1451	1	0	1.0	0.4	1.1
44613	39.8	-35.6	ALL	P	SUR	777	0	0	0.7	0.0	0.7
44616	51.3	-21.6	ALL	P	SUR	929	11	1	1.2	0.2	1.2
44617	53.1	-21.8	ALL	P	SUR	1229	8	1	1.0	0.2	1.0
44621	56.1	-10.4	ALL	P	SUR	927	1	0	1.0	-0.2	1.1
44726	54.5	-38.6	ALL	P	SUR	1362	1	0	1.0	0.0	1.0
44727	59.6	-18.6	ALL	P	SUR	2244	11	0	0.9	0.3	0.9
44738	44.3	-53.6	ALL	P	SUR	1	0	0	0.0	1.6	1.6
44742	46.5	-35.6	ALL	P	SUR	910	4	0	1.1	0.1	1.1
44743	45.4	-50.2	ALL	P	SUR	776	2	0	1.4	-0.1	1.4
44760	33.0	-29.9	ALL	P	SUR	71	0	0	1.4	-0.6	1.5
44765	57.9	-48.1	ALL	P	SUR	805	4	0	1.2	-0.2	1.2
44767	53.4	-44.5	ALL	P	SUR	570	1	0	1.3	-0.4	1.4
44768	58.4	-20.9	ALL	P	SUR	1528	4	0	0.9	0.4	1.0
44770	57.7	-33.3	ALL	P	SUR	984	1	0	1.1	-0.5	1.2
44771	54.0	-19.0	ALL	P	SUR	43	1	2	0.6	0.1	0.6
44773	55.8	-15.2	ALL	P	SUR	1398	7	1	1.0	0.1	1.0
44774	51.3	-46.0	ALL	P	SUR	992	4	0	1.6	-1.0	1.9
44775	57.6	-34.9	ALL	P	SUR	1269	19	1	3.8	2.2	4.4
44776	47.7	-44.6	ALL	P	SUR	947	1	0	1.0	-0.1	1.0
44778	58.0	-59.2	ALL	P	SUR	1458	3	0	1.1	-0.5	1.2
44779	43.1	-44.6	ALL	P	SUR	800	0	0	1.0	-0.1	1.0
44780	57.8	-19.5	ALL	P	SUR	1487	6	0	0.9	0.4	0.9
44901	55.6	-45.5	ALL	P	SUR	156	0	0	1.0	0.7	1.2
44912	52.2	-24.1	ALL	P	SUR	143	0	0	1.0	0.8	1.3
44925	54.8	-53.8	ALL	P	SUR	177	0	0	1.2	0.6	1.3
48518	76.1	-14.5	ALL	P	SUR	767	0	0	0.8	-0.1	0.8
52643	44.7	-63.6	ALL	P	SUR	19	12	63	0.9	-5.5	5.6

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
62506	46.8	-10.7	ALL	P	SUR	535	0	0	0.9	0.0	0.9
62508	46.7	-5.6	ALL	P	SUR	449	0	0	0.8	0.1	0.8
62509	45.9	-4.8	ALL	P	SUR	738	1	0	0.8	0.0	0.8
62510	46.6	-5.2	ALL	P	SUR	754	0	0	0.8	0.2	0.8
62511	45.5	-6.4	ALL	P	SUR	204	0	0	0.8	0.8	1.1
62551	44.5	-10.9	ALL	P	SUR	327	0	0	0.8	0.3	0.9
62553	51.6	-12.9	ALL	P	SUR	890	3	0	1.4	0.1	1.4
62557	44.1	-6.9	ALL	P	SUR	920	36	4	2.8	0.7	2.9
62673	64.1	-21.9	ALL	P	SUR	270	0	0	1.2	-0.5	1.3
62674	62.6	-19.2	ALL	P	SUR	531	0	0	0.9	-0.2	0.9
62755	45.7	-6.1	ALL	P	SUR	79	0	0	2.2	-1.0	2.4
62758	45.4	-25.6	ALL	P	SUR	204	0	0	1.5	-0.3	1.5
62809	57.0	0.0	ALL	P	SUR	1	0	0	0.0	1.2	1.2
62963	47.5	-8.5	ALL	P	SUR	1	0	0	0.0	-0.2	0.2
63666	73.4	-14.6	ALL	P	SUR	214	0	0	0.8	-0.1	0.8
64528	57.0	-20.1	ALL	P	SUR	1055	2	0	1.0	-0.3	1.0
64529	62.0	-31.4	ALL	P	SUR	1551	2	0	1.3	-0.4	1.3
64530	61.0	-58.5	ALL	P	SUR	368	4	1	0.7	0.1	0.7
64561	50.8	-12.4	ALL	P	SUR	909	6	1	1.0	0.3	1.1
64563	59.6	-28.4	ALL	P	SUR	1998	5	0	1.1	-0.1	1.1
65562	59.5	-16.5	ALL	P	SUR	2017	1	0	1.0	-0.1	1.0
65571	61.3	-31.2	ALL	P	SUR	1667	6	0	1.1	-0.1	1.1
65591	64.4	-34.5	ALL	P	SUR	1058	3	0	1.1	0.0	1.1
65592	62.2	-23.1	ALL	P	SUR	1640	8	0	1.1	-0.2	1.1
65597	54.5	-19.6	ALL	P	SUR	1584	1	0	1.1	-0.4	1.2
99807	12.5	-78.8	ALL	P	SUR	1	0	0	0.0	0.9	0.9
WIND SPEED											
13502	14.9	-41.6	ALL	SPEED	SUR	276	0	0	2.3	0.8	2.4
13503	19.5	-38.2	ALL	SPEED	SUR	279	0	0	1.4	0.2	1.4
13605	42.9	-40.1	ALL	SPEED	SUR	1	0	0	0.0	2.5	2.5
41501	19.3	-43.2	ALL	SPEED	SUR	243	0	0	1.8	1.3	2.2
41502	21.6	-43.9	ALL	SPEED	SUR	219	1	0	1.9	1.2	2.2
41520	20.4	-44.2	ALL	SPEED	SUR	236	0	0	1.9	2.1	2.9
41521	22.1	-55.4	ALL	SPEED	SUR	315	0	0	1.4	0.1	1.4
41522	11.7	-53.2	ALL	SPEED	SUR	292	0	0	3.5	-0.7	3.6
41523	15.9	-57.8	ALL	SPEED	SUR	262	1	0	1.3	-1.2	1.7
41598	22.9	-42.5	ALL	SPEED	SUR	159	0	0	1.6	0.1	1.6
41599	23.0	-37.5	ALL	SPEED	SUR	136	0	0	1.4	0.3	1.5
41600	12.5	-37.6	ALL	SPEED	SUR	53	0	0	2.0	0.6	2.0
41601	18.0	-42.8	ALL	SPEED	SUR	181	0	0	1.3	0.4	1.4
41633	12.5	-47.9	ALL	SPEED	SUR	153	0	0	1.9	0.2	2.0
41634	12.6	-52.9	ALL	SPEED	SUR	146	0	0	1.8	-0.1	1.8
41635	17.6	-52.3	ALL	SPEED	SUR	143	0	0	1.2	0.0	1.2
41636	17.7	-47.9	ALL	SPEED	SUR	133	0	0	2.1	-0.6	2.2
41637	22.3	-47.8	ALL	SPEED	SUR	32	0	0	1.2	0.9	1.5
41638	22.2	-52.9	ALL	SPEED	SUR	88	0	0	1.6	0.2	1.6
42534	45.4	-36.9	ALL	SPEED	SUR	3	0	0	1.7	-1.0	1.9
42565901	40.0	-20.0	ALL	SPEED	SUR	2	0	0	0.0	-0.8	0.8
44601	54.1	-48.3	ALL	SPEED	SUR	622	0	0	1.9	0.8	2.1
44602	52.6	-38.7	ALL	SPEED	SUR	577	0	0	2.1	0.3	2.1
44609	59.0	-20.9	ALL	SPEED	SUR	1523	0	0	3.0	0.5	3.1
44621	56.1	-10.4	ALL	SPEED	SUR	264	1	0	2.1	0.5	2.2
44738	44.3	-53.6	ALL	SPEED	SUR	1	0	0	0.0	-2.0	2.0
44773	55.8	-15.2	ALL	SPEED	SUR	2204	2	0	2.3	-4.2	4.8
62502	45.9	-6.9	ALL	SPEED	SUR	496	0	0	1.6	-0.3	1.6
62504	46.1	-6.4	ALL	SPEED	SUR	345	0	0	1.4	-0.5	1.4
62551	44.5	-10.9	ALL	SPEED	SUR	273	0	0	1.7	0.6	1.8

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
WIND SPEED											
62553	51.6	-12.9	ALL	SPEED	SUR	1080	0	0	1.9	-1.0	2.2
62557	44.1	-6.9	ALL	SPEED	SUR	1	0	0	0.0	1.3	1.3
62560	44.9	-5.1	ALL	SPEED	SUR	523	1	0	1.6	-0.5	1.7
62561	44.2	-6.9	ALL	SPEED	SUR	325	0	0	2.9	-1.6	3.3
62562	46.0	-4.7	ALL	SPEED	SUR	386	0	0	1.7	-0.3	1.7
62563	44.4	-7.0	ALL	SPEED	SUR	583	0	0	2.2	0.3	2.2
62564	46.6	-6.1	ALL	SPEED	SUR	332	0	0	1.6	-0.2	1.6
62565	46.6	-7.0	ALL	SPEED	SUR	382	0	0	1.4	-0.7	1.5
62566	46.3	-7.0	ALL	SPEED	SUR	366	0	0	1.4	-0.3	1.4
62568	44.3	-7.7	ALL	SPEED	SUR	390	0	0	2.1	0.7	2.2
62569	46.2	-5.7	ALL	SPEED	SUR	337	0	0	1.4	-0.2	1.4
62570	46.3	-6.9	ALL	SPEED	SUR	402	0	0	1.5	-0.1	1.5
62674	62.6	-19.2	ALL	SPEED	SUR	866	0	0	1.9	-1.4	2.3
62752	45.6	-4.0	ALL	SPEED	SUR	344	0	0	1.5	0.0	1.5
62755	45.7	-6.1	ALL	SPEED	SUR	330	0	0	1.3	-0.5	1.4
62758	45.4	-25.6	ALL	SPEED	SUR	866	0	0	2.1	-0.1	2.1
62809	57.0	0.0	ALL	SPEED	SUR	2	0	0	0.0	1.5	1.5
62843	61.3	-2.7	ALL	SPEED	SUR	2	0	0	0.0	1.6	1.6
62963	47.5	-8.5	ALL	SPEED	SUR	2	0	0	0.0	-2.6	2.6
65597	54.5	-19.6	ALL	SPEED	SUR	1	0	0	0.0	-0.7	0.7
99807	12.5	-78.8	ALL	SPEED	SUR	2	0	0	0.0	0.5	0.5
WIND DIRECTION											
13502	14.9	-41.6	ALL	DIRN.	SUR	184	0	0	22.7	-17.6	28.7
13503	19.5	-38.2	ALL	DIRN.	SUR	231	0	0	13.9	0.1	13.9
13605	42.9	-40.1	ALL	DIRN.	SUR	1	0	0	0.0	-14.5	14.5
41501	19.3	-43.2	ALL	DIRN.	SUR	207	0	0	18.7	-2.9	18.9
41502	21.6	-43.9	ALL	DIRN.	SUR	196	1	1	15.0	-3.8	15.5
41503	16.5	-53.8	ALL	DIRN.	SUR	242	0	0	27.6	29.0	40.1
41520	20.4	-44.2	ALL	DIRN.	SUR	214	0	0	14.4	-9.5	17.3
41521	22.1	-55.4	ALL	DIRN.	SUR	219	0	0	19.5	0.1	19.5
41522	11.7	-53.2	ALL	DIRN.	SUR	120	0	0	35.8	-7.1	36.5
41523	15.9	-57.8	ALL	DIRN.	SUR	172	1	1	14.5	1.3	14.6
41598	22.9	-42.5	ALL	DIRN.	SUR	146	0	0	12.9	-1.4	13.0
41599	23.0	-37.5	ALL	DIRN.	SUR	114	0	0	15.4	1.9	15.6
41600	12.5	-37.6	ALL	DIRN.	SUR	12	0	0	18.2	-17.0	24.9
41601	18.0	-42.8	ALL	DIRN.	SUR	173	0	0	20.8	-15.7	26.0
41633	12.5	-47.9	ALL	DIRN.	SUR	46	0	0	28.6	-36.5	46.4
41634	12.6	-52.9	ALL	DIRN.	SUR	89	0	0	19.3	-12.6	23.1
41635	17.6	-52.3	ALL	DIRN.	SUR	78	0	0	16.8	0.0	16.8
41636	17.7	-47.9	ALL	DIRN.	SUR	89	0	0	23.3	-56.7	61.3
41637	22.3	-47.8	ALL	DIRN.	SUR	39	0	0	12.7	-12.9	18.1
41638	22.2	-52.9	ALL	DIRN.	SUR	94	0	0	20.8	4.1	21.2
42534	45.4	-36.9	ALL	DIRN.	SUR	1	0	0	0.0	1.8	1.8
44601	54.1	-48.3	ALL	DIRN.	SUR	359	0	0	21.5	1.9	21.6
44602	52.6	-38.7	ALL	DIRN.	SUR	284	0	0	31.8	0.1	31.8
44609	59.0	-20.9	ALL	DIRN.	SUR	786	0	0	23.4	5.3	24.0
44621	56.1	-10.4	ALL	DIRN.	SUR	443	1	0	53.0	4.9	53.2
44738	44.3	-53.6	ALL	DIRN.	SUR	1	0	0	0.0	-3.1	3.1
44773	55.8	-15.2	ALL	DIRN.	SUR	489	2	0	21.7	-5.5	22.4
62502	45.9	-6.9	ALL	DIRN.	SUR	171	0	0	19.9	14.0	24.4
62504	46.1	-6.4	ALL	DIRN.	SUR	124	0	0	14.8	-10.5	18.1
62551	44.5	-10.9	ALL	DIRN.	SUR	111	0	0	24.8	-6.9	25.8
62553	51.6	-12.9	ALL	DIRN.	SUR	664	0	0	14.6	-4.0	15.2
62560	44.9	-5.1	ALL	DIRN.	SUR	84	1	1	16.2	12.8	20.6
62561	44.2	-6.9	ALL	DIRN.	SUR	60	0	0	19.9	9.3	21.9
62562	46.0	-4.7	ALL	DIRN.	SUR	133	0	0	17.6	12.7	21.8
62563	44.4	-7.0	ALL	DIRN.	SUR	127	0	0	17.0	-6.1	18.0

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
WIND DIRECTION											
62564	46.6	-6.1	ALL	DIRN.	SUR	114	0	0	15.2	5.2	16.0
62565	46.6	-7.0	ALL	DIRN.	SUR	160	0	0	17.8	9.8	20.3
62566	46.3	-7.0	ALL	DIRN.	SUR	133	0	0	21.0	6.6	22.0
62568	44.3	-7.7	ALL	DIRN.	SUR	125	0	0	29.2	1.3	29.3
62569	46.2	-5.7	ALL	DIRN.	SUR	122	0	0	22.8	12.2	25.8
62570	46.3	-6.9	ALL	DIRN.	SUR	124	0	0	17.4	0.1	17.4
62674	62.6	-19.2	ALL	DIRN.	SUR	187	0	0	17.2	-4.5	17.8
62752	45.6	-4.0	ALL	DIRN.	SUR	137	0	0	15.9	9.9	18.8
62755	45.7	-6.1	ALL	DIRN.	SUR	105	0	0	16.7	0.9	16.7
62758	45.4	-25.6	ALL	DIRN.	SUR	352	0	0	23.2	-4.0	23.5
65597	54.5	-19.6	ALL	DIRN.	SUR	1	0	0	0.0	99.1	99.1

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: July 1998

Monitoring procedures:

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :40°N - 70°N, 60°W - 0°W.

Standard of comparison :Background field from Bracknell global model.

Observation times :All hours combined.

Level(s) monitored :300.0 - 150.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

Parameters monitored	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP ≥ 20

NB: US ACARs and ADS data are shown at the bottom of the table as US ACAR and ADS respectively.

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	3507	0	30	1.9	-0.2	2566	0	16	0	7.3	1.0
ACA	1824	1	10	2.0	0.1	1663	0	5	0	6.6	0.2
AEA	280	1	32	2.1	0.7	243	0	27	0	8.7	-1.1
AEL	398	1	20	1.6	-0.7	402	0	21	0	7.4	0.2
AEY	38	0	11	1.8	0.6	38	0	5	0	5.9	0.6
AFL	343	1	13	2.1	0.6	311	0	9	0	8.4	0.3
AFR	1147	0	13	1.7	0.0	1162	0	13	0	8.6	0.7
AIH	129	1	12	1.6	0.1	109	1	7	0	7.3	0.8
AJM	80	1	8	1.4	-0.7	75	0	4	0	10.0	0.7
AMT	39	0	26	3.5	2.0	42	0	21	0	10.2	0.1
AMX	194	0	5	1.5	0.3	195	0	6	0	7.9	0.4
ANZ	200	0	3	2.3	-1.4	199	1	3	0	6.2	0.2
AOM	332	1	6	1.7	0.8	341	0	6	0	7.2	0.7
AUA	43	0	30	2.2	-0.5	36	0	11	0	8.7	1.5
AVA	142	1	4	1.5	0.1	151	0	6	0	7.7	0.8
AZA	373	0	22	2.1	-0.1	324	0	14	0	7.5	0.5
BAL	543	0	25	1.3	-0.4	536	0	25	0	7.5	0.0
BAW	1396	0	20	2.0	-0.1	1228	0	14	0	7.0	0.9
BWA	103	0	18	1.7	0.6	91	0	13	0	5.7	1.1
CDN	801	0	14	2.0	0.4	710	0	6	0	7.6	1.0
CFG	547	0	5	1.7	-1.0	532	0	6	0	8.2	0.1
CKS	78	0	13	2.6	1.4	79	1	6	0	6.9	1.1
CKT	118	3	14	1.8	0.7	102	0	10	0	9.0	0.4
CLX	228	0	7	1.9	-0.6	219	0	4	0	6.7	0.7
CMM	466	0	14	1.7	0.2	414	0	8	0	6.2	0.9
COA	931	0	26	1.9	-0.1	742	0	18	0	11.8	2.0
CRL	291	1	6	1.5	0.3	290	0	6	0	7.6	1.0
CTB	341	0	1	1.8	-0.7	337	0	1	0	5.7	0.4
CTM	62	2	29	2.7	-1.0	60	0	22	0	6.1	1.0
CUB	232	2	15	2.1	0.8	230	0	13	0	9.9	0.6
DAL	2330	0	32	1.9	-0.4	1683	0	19	0	7.2	0.5
DBY	159	0	1	1.5	-0.9	161	0	4	0	8.3	0.1
DHL	192	11	100	5.7	-4.1	146	0	18	0	9.0	1.1
DLH	2658	0	19	2.0	-0.1	2302	0	14	0	6.8	0.9
EIA	23	0	17	2.1	0.9	22	0	32	0	20.2	7.3
EIN	27	0	0	1.4	0.3	29	0	0	0	7.7	2.7
ELY	210	0	16	1.7	-0.1	196	1	16	0	9.8	1.3
ETH	23	0	13	2.3	-0.7	21	0	10	0	8.8	2.4
EWW	117	1	27	2.4	1.0	96	0	100	0	14.6	3.3
FDX	359	1	27	2.1	0.5	267	0	11	0	7.4	0.3
FIN	523	0	25	2.3	0.3	390	1	12	0	7.5	0.8
GAF	92	0	25	2.3	0.3	67	0	12	0	8.1	1.9
GRL	34	0	0	1.6	0.2	32	0	0	0	5.7	1.9
GTI	26	0	19	2.6	1.1	20	0	5	0	8.1	0.3
HLF	51	0	10	1.3	-0.7	44	0	2	0	6.0	0.1
IBE	1113	1	29	1.7	0.4	996	0	26	0	8.4	1.0
ICE	939	1	29	2.5	0.2	714	0	17	0	7.5	0.4
JKK	181	1	30	1.3	-0.1	154	0	21	0	7.3	-0.8
KLM	2363	0	27	1.8	-0.1	2225	0	24	0	7.8	0.7
LDA	94	0	30	1.3	-0.9	88	1	26	0	6.2	0.2
LDI	278	0	32	1.6	-1.0	245	0	29	0	8.4	0.3
LEI	89	0	10	1.7	0.4	85	0	8	0	9.9	-0.1
LIB	134	0	4	1.7	0.7	144	0	7	0	8.4	0.9
LOT	331	1	23	2.3	-1.3	272	1	12	0	7.0	0.3
LTU	585	0	22	1.7	-0.2	498	0	13	0	6.8	0.8
LXR	68	3	25	1.2	0.6	68	1	28	0	10.0	1.6
MAH	49	0	33	2.1	-0.9	40	0	20	0	9.2	0.3
MAS	75	0	31	2.0	0.2	62	2	23	0	11.8	0.6
MON	130	0	15	1.4	0.1	116	0	9	0	6.2	0.6

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
MPD	107	1	14	1.9	0.3	98	0	7	0	6.0	0.3
MPH	620	0	8	1.8	-0.8	594	0	5	0	7.0	0.4
NWA	3737	0	10	1.9	0.6	3402	0	6	0	8.5	0.7
OAL	31	0	19	3.3	2.8	26	0	12	0	8.5	-0.8
PAC	78	0	21	2.1	0.6	62	0	13	0	8.5	1.2
RAM	69	0	4	1.9	-0.2	70	1	11	0	8.1	-1.2
RCH	230	3	23	1.7	-0.2	207	1	22	0	10.5	0.9
ROY	321	1	16	2.1	-0.3	276	0	8	0	8.3	1.4
RRR	180	2	29	2.2	-0.3	154	0	22	0	8.3	0.2
SAB	113	0	13	1.9	0.4	97	0	9	0	7.4	1.2
SAS	1333	0	1	1.9	-0.2	1320	0	2	0	7.1	0.5
SIA	150	0	4	1.8	-0.8	152	0	6	0	7.6	1.1
SLR	96	3	22	1.6	-0.7	100	0	22	0	7.5	-0.7
SVA	173	1	10	1.7	-0.6	191	1	11	0	8.7	0.9
SWR	160	1	23	1.6	0.2	130	0	15	0	6.8	2.1
TAP	321	1	7	1.4	-0.5	306	0	7	0	8.3	0.1
TOW	156	0	29	1.9	0.2	116	0	12	0	8.1	1.1
TSC	360	1	18	2.1	0.5	308	0	12	0	8.1	1.1
TWA	1386	0	34	1.9	0.3	963	0	21	0	7.4	0.6
UAL	2040	1	17	2.1	-0.1	1740	0	9	0	6.9	0.8
UPS	506	1	36	1.9	0.3	416	0	31	0	7.9	1.5
USA	341	0	28	1.6	-0.3	269	0	18	0	7.2	1.1
VIR	367	1	15	2.0	-0.4	319	0	8	0	7.0	0.5
VKG	46	0	4	1.1	0.1	44	0	2	0	7.1	1.5
WOA	34	0	18	1.3	0.4	30	0	17	0	8.6	1.3
BA	5702	0	1	1.4	0.3	5702	0	1	0	6.7	0.6
KL	4263	5	6	1.7	1.0	4263	0	30	0	9.9	1.3
LH	663	0	0	1.7	0.7	663	0	0	0	5.7	0.8
N	357	3	17	2.4	0.5	327	0	13	0	11.2	0.8
ADS	134	0	13	1.3	-0.1	134	0	12	0	5.9	0.8
US ACARS	13524	0	3	1.4	0.3	13520	0	1	0	6.7	0.5

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: July 1998

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from selected radiosonde TEMPs.

Area monitored :0°N - 90°N, 100°W - 40°E

Standard of comparison :Background field from Bracknell global model.

Position :Average latitude and longitude for period.

Observation times :00, 12 UTC.

Level monitored :100 hPa.

Element monitored :GEOPOTENTIAL HEIGHT in metres

Parameters monitored :NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:SD :SD of difference of observations from background values at level shown excluding those with gross errors.

:BIAS :Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DBBH	00	Z	100	4	0	29.8	29.8	1.3
DBBH	12	Z	100	21	0	56.5	56.7	-4.9
DBLK	00	Z	100	1	0	0.0	7.0	7.0
DBLK	12	Z	100	7	0	8.8	8.9	0.7
ELML7	00	Z	100	17	0	15.0	18.3	-10.5
ELML7	12	Z	100	14	0	18.2	21.9	-12.3
FNOR	00	Z	100	11	0	15.0	18.6	11.1
FNOR	12	Z	100	13	0	19.9	20.6	-5.6
FNOU	00	Z	100	5	0	14.9	14.9	-0.4
FNOU	12	Z	100	10	0	21.9	23.5	-8.4
FNPH	00	Z	100	10	0	12.9	13.3	-3.2
FNPH	12	Z	100	11	0	14.2	19.6	-13.5
FNRS	00	Z	100	13	0	8.7	8.7	-0.5
FNRS	12	Z	100	14	0	19.8	25.8	-16.4
JBOA	00	Z	100	1	0	0.0	4.0	4.0
JCCX	00	Z	100	1	0	0.0	1.0	-1.0
JGQH	00	Z	100	1	0	0.0	32.0	32.0
JIVB	00	Z	100	1	0	0.0	7.0	7.0
JPNOM	00	Z	100	1	0	0.0	10.0	10.0
LDWR	00	Z	100	30	0	11.0	11.7	4.1
LDWR	12	Z	100	29	0	7.6	9.1	-4.9
OVYA2	00	Z	100	15	0	15.2	21.5	-15.3
OVYA2	12	Z	100	13	0	21.3	23.7	-10.3
OXYH2	00	Z	100	19	0	12.8	19.3	-14.5
OXYH2	12	Z	100	20	0	16.4	26.1	-20.3
SHIPS	00	Z	100	2	0	22.5	29.8	19.5
TRAC98	00	Z	100	1	0	0.0	31.0	31.0
TRAC98	12	Z	100	2	0	4.5	19.0	18.5
UBNR	00	Z	100	1	0	0.0	0.0	0.0
UCKZ	00	Z	100	5	0	6.7	26.9	26.0
V2GH	00	Z	100	1	0	0.0	14.0	14.0
V2VM	00	Z	100	9	0	19.3	24.2	-14.6
V2VM	12	Z	100	16	0	14.9	21.8	-15.9
V2VM/81	00	Z	100	1	0	0.0	16.0	-16.0
V2XM	00	Z	100	4	0	14.3	15.7	6.5
V2XM	12	Z	100	2	0	10.0	10.0	0.0
WTEC	00	Z	100	7	0	11.1	13.0	-6.7
WTEC	12	Z	100	4	0	5.5	17.4	-16.5
03953	00	Z	100	27	0	17.7	21.0	11.4
03953	12	Z	100	28	0	17.7	17.7	0.1
04018	00	Z	100	28	0	17.7	25.1	17.8
04018	12	Z	100	26	0	14.8	20.0	13.5
04220	00	Z	100	5	0	8.9	31.3	30.0
04220	12	Z	100	8	0	11.8	19.5	15.5
04270	00	Z	100	27	0	10.9	11.1	-2.3
04270	12	Z	100	29	0	12.3	14.1	-7.0
04339	00	Z	100	19	0	14.1	15.6	6.8
04339	12	Z	100	23	0	8.6	10.7	6.3
04360	00	Z	100	27	0	15.2	17.9	9.4
04360	12	Z	100	29	0	9.0	14.4	11.2
08001	00	Z	100	21	0	12.2	14.0	6.9
08001	12	Z	100	19	0	16.4	21.8	-14.3
08508	00	Z	100	1	0	0.0	11.0	-11.0
08508	12	Z	100	20	0	17.9	26.6	-19.7
08522	00	Z	100	1	0	0.0	9.0	-9.0
08522	12	Z	100	29	0	13.5	22.2	-17.7
08594	00	Z	100	1	0	0.0	9.0	9.0
08594	12	Z	100	13	1	12.9	12.9	-0.3
60020	00	Z	100	27	0	12.7	13.9	-5.7

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
60020	12	Z	100	29	0	17.0	18.7	-7.8
71600	00	Z	100	29	0	9.6	14.3	10.6
71600	12	Z	100	30	0	12.9	13.4	3.4
72201	00	Z	100	25	0	26.2	32.6	19.4
72201	12	Z	100	27	0	16.6	25.3	19.1
72402	00	Z	100	27	0	18.1	33.4	28.1
72402	12	Z	100	29	0	19.3	35.5	29.8
74494	00	Z	100	20	0	12.1	12.2	1.7
74494	12	Z	100	26	0	14.0	24.1	-19.6
78016	00	Z	100	27	1	15.5	15.5	-0.2
78016	12	Z	100	27	0	14.3	14.5	-2.6

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: July 1998

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
CGDX	00	Z	500	1	0	0.0	21.0	21.0
DBBH	00	Z	500	5	0	21.4	28.6	19.0
DBBH	12	Z	500	22	0	11.6	12.7	-5.2
DBLK	00	Z	500	1	0	0.0	5.0	-5.0
DBLK	12	Z	500	7	0	7.7	13.2	-10.7
ELML7	00	Z	500	19	0	7.3	7.6	2.1
ELML7	12	Z	500	17	0	10.5	10.6	-0.9
FNOR	00	Z	500	11	0	8.1	14.3	11.7
FNOR	12	Z	500	13	0	11.8	12.9	5.4
FNOU	00	Z	500	10	0	7.5	13.6	11.4
FNOU	12	Z	500	12	0	11.3	12.9	6.2
FNPH	00	Z	500	12	0	13.3	13.3	0.3
FNPH	12	Z	500	14	0	8.8	8.8	0.3
FNRS	00	Z	500	14	0	7.5	7.6	1.1
FNRS	12	Z	500	14	0	11.5	11.7	-2.4
JBOA	00	Z	500	1	0	0.0	8.0	8.0
JCCX	00	Z	500	1	0	0.0	13.0	13.0
JGQH	00	Z	500	1	0	0.0	12.0	12.0
JIVB	00	Z	500	1	0	0.0	12.0	12.0
JPNOM	00	Z	500	1	0	0.0	10.0	10.0
LDWR	00	Z	500	30	0	9.6	10.7	4.8
LDWR	12	Z	500	29	0	7.0	7.4	-2.5
OVYA2	00	Z	500	15	0	9.6	14.8	-11.3
OVYA2	12	Z	500	13	0	6.6	12.6	-10.7
OXYH2	00	Z	500	20	0	9.5	18.0	-15.3
OXYH2	12	Z	500	22	0	10.2	26.6	-24.6
SHIPS	00	Z	500	3	0	2.8	10.4	10.0
SHIPS	12	Z	500	1	0	0.0	14.0	14.0
TRAC98	00	Z	500	1	0	0.0	12.0	12.0
TRAC98	12	Z	500	2	0	3.5	10.1	9.5
UBNR	00	Z	500	1	0	0.0	19.0	19.0
UCKZ	00	Z	500	5	0	12.0	13.5	6.2
V2GH	00	Z	500	1	0	0.0	8.0	8.0
V2VM	00	Z	500	10	0	10.6	11.6	-4.7
V2VM	12	Z	500	16	0	12.9	18.8	-13.7
V2VM/8100		Z	500	1	0	0.0	11.0	-11.0
V2XM	00	Z	500	4	0	2.5	13.7	13.5
V2XM	12	Z	500	2	0	22.5	25.3	-11.5
WTEC	00	Z	500	7	0	7.1	7.1	0.4
WTEC	12	Z	500	4	0	14.4	14.4	1.0
03953	00	Z	500	30	0	11.7	16.5	11.7
03953	12	Z	500	30	0	11.1	11.4	2.6
04018	00	Z	500	30	0	11.0	17.6	13.8
04018	12	Z	500	30	0	8.4	10.8	6.9
04220	00	Z	500	29	1	10.1	12.0	6.4
04220	12	Z	500	29	0	10.4	11.0	3.6
04270	00	Z	500	29	0	8.1	8.1	0.3
04270	12	Z	500	29	0	12.2	14.9	-8.5
04339	00	Z	500	30	0	12.0	16.2	10.9
04339	12	Z	500	30	0	9.4	10.5	4.7
04360	00	Z	500	28	0	11.0	11.0	0.4
04360	12	Z	500	30	0	10.8	11.9	-5.1
08001	00	Z	500	29	0	16.2	17.2	5.7
08001	12	Z	500	29	0	14.4	14.7	-2.9
08508	00	Z	500	1	0	0.0	9.0	-9.0
08508	12	Z	500	28	1	9.1	11.0	-6.1
08522	00	Z	500	1	0	0.0	18.0	-18.0
08522	12	Z	500	29	0	8.5	10.0	-5.3
08594	00	Z	500	1	0	0.0	16.0	16.0

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
08594	12	Z	500	16	0	9.3	10.7	5.3
60020	00	Z	500	28	0	14.2	14.4	-2.6
60020	12	Z	500	29	0	11.5	14.5	-8.9
71600	00	Z	500	29	0	7.2	7.5	2.0
71600	12	Z	500	30	0	10.7	12.7	6.7
72201	00	Z	500	25	0	9.8	12.8	8.3
72201	12	Z	500	27	1	6.9	11.3	9.0
72402	00	Z	500	28	0	16.4	16.5	-0.8
72402	12	Z	500	29	0	10.4	11.8	5.6
74494	00	Z	500	28	0	7.9	8.0	-0.5
74494	12	Z	500	30	0	11.3	11.3	0.4
78016	00	Z	500	28	0	21.8	25.0	12.2
78016	12	Z	500	27	0	9.2	12.8	8.8

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: July 1998

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from selected radiosonde TEMPs.

Area monitored :0°N - 90°N, 100°W - 40°E

Standard of comparison :Background field from Bracknell global model.

Position :Average latitude and longitude for period.

Observation times :00, 12 UTC.

Level monitored :100 hPa.

Element monitored :VECTOR WIND in m s^{-1}

Parameters monitored
- :NUM OBS :Number of observations available at level shown during period.
- :NUM GROSS :Number of gross errors at level shown during period.
- :UBIAS,VBIAS :Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
- :RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBBH	00	V	100	4	0	0	0.0	2.5	2.8
DBBH	12	V	100	18	0	0	0.0	-1.2	-0.6
DBLK	00	V	100	1	0	0	3.2	-0.8	0.7
DBLK	12	V	100	7	0	0	3.2	0.5	0.4
ELML7	00	V	100	15	0	0	1.7	-0.8	1.6
ELML7	12	V	100	13	0	0	3.9	0.1	-0.9
FNOR	00	V	100	8	0	0	2.5	0.1	0.8
FNOR	12	V	100	9	0	0	2.5	0.5	1.9
FNOU	00	V	100	3	0	0	2.5	-7.6	0.5
FNOU	12	V	100	6	0	0	2.5	-0.8	1.5
FNPH	00	V	100	9	0	0	2.5	-2.0	0.0
FNPH	12	V	100	10	0	0	2.5	-1.3	-0.1
FNRS	00	V	100	9	0	0	3.8	-0.2	3.1
FNRS	12	V	100	11	0	0	3.8	0.4	-1.2
JBOA	00	V	100	1	0	0	2.1	0.0	-0.7
JCCX	00	V	100	1	0	0	1.7	-0.3	2.1
JGQH	00	V	100	1	0	0	1.7	1.5	1.4
JIVB	00	V	100	1	0	0	1.7	0.3	-0.6
JPNOM	00	V	100	1	0	0	1.7	-0.6	0.3
LDWR	00	V	100	30	0	0	2.1	0.0	0.0
LDWR	12	V	100	29	0	0	1.6	-0.3	-0.3
OVYA2	00	V	100	14	0	0	2.1	-0.6	0.1
OVYA2	12	V	100	11	0	0	1.8	-0.3	-0.2
OXYH2	00	V	100	16	0	0	1.6	-1.2	0.6
OXYH2	12	V	100	17	0	0	4.9	-1.8	0.5
SHIPS	00	V	100	1	0	0	4.6	-1.1	4.2
TRAC98	00	V	100	1	0	0	4.6	0.9	2.4
TRAC98	12	V	100	2	0	0	4.6	2.9	1.9
UBNR	00	V	100	1	0	0	4.6	1.2	-0.4
V2GH	00	V	100	1	0	0	4.6	1.9	-1.8
V2VM	00	V	100	9	0	0	4.6	1.6	1.7
V2VM	12	V	100	14	0	0	4.6	0.5	0.6
V2VM/8100		V	100	1	0	0	5.2	1.3	4.5
V2XM	00	V	100	4	0	0	5.2	-1.9	-2.8
V2XM	12	V	100	2	0	0	5.2	-0.7	-0.1
03953	00	V	100	27	0	0	2.7	-0.3	2.0
03953	12	V	100	28	0	0	2.3	-0.4	1.4
04018	00	V	100	13	0	0	1.8	0.4	0.4
04018	12	V	100	5	0	0	4.9	-0.6	1.6
04220	00	V	100	3	0	0	4.9	2.9	4.6
04220	12	V	100	5	0	0	4.9	-1.7	1.2
04270	00	V	100	26	0	0	4.9	-0.6	-0.1
04270	12	V	100	24	0	0	1.8	-0.5	0.3
04339	00	V	100	17	0	5	2.5	-1.4	-1.6
04339	12	V	100	18	0	0	5.1	-2.4	0.4
04360	00	V	100	26	0	0	4.9	-1.4	-0.4
04360	12	V	100	29	0	0	2.2	-1.6	-0.2
08001	00	V	100	21	0	0	11.5	2.2	4.3
08001	12	V	100	19	0	0	4.7	-1.4	0.0
08508	00	V	100	1	0	0	4.7	-3.0	0.5
08508	12	V	100	15	0	0	4.7	0.0	-0.6
60020	00	V	100	20	0	0	6.2	0.1	0.2
60020	12	V	100	21	0	0	5.4	0.0	-1.8
71600	00	V	100	29	0	0	2.3	-1.6	0.9
71600	12	V	100	29	0	0	3.7	-0.3	-0.8
72201	00	V	100	25	0	0	2.5	0.9	-1.0
72201	12	V	100	27	0	3	3.8	0.1	0.3
72402	00	V	100	27	0	0	2.8	-1.2	-0.4
72402	12	V	100	29	0	0	2.3	-2.6	1.6
74494	00	V	100	20	0	0	2.3	-1.1	0.0
74494	12	V	100	26	0	0	2.0	-1.4	1.1
78016	00	V	100	28	0	0	5.4	-1.0	-2.4
78016	12	V	100	27	0	0	3.4	-0.9	0.9

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: July 1998

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS:	Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
CGDX	00	V	500	1	0	0	0.0	0.9	0.0
DBBH	00	V	500	4	0	0	3.4	-0.1	-0.7
DBBH	12	V	500	18	0	0	3.4	-0.2	-0.6
DBLK	00	V	500	1	0	0	2.6	-1.1	2.0
DBLK	12	V	500	6	0	0	2.6	1.9	2.4
ELML7	00	V	500	16	0	0	5.1	-0.5	0.9
ELML7	12	V	500	16	0	0	2.1	-0.5	-0.9
FNOR	00	V	500	8	0	0	2.3	-0.7	0.1
FNOR	12	V	500	9	0	0	2.3	1.2	0.7
FNOU	00	V	500	7	0	14	2.3	0.1	-2.0
FNOU	12	V	500	9	0	11	2.3	-0.3	-0.5
FNPH	00	V	500	9	0	0	2.3	0.2	-0.7
FNPH	12	V	500	11	0	9	2.3	-0.8	-0.6
FNRS	00	V	500	10	0	0	2.9	0.7	0.5
FNRS	12	V	500	11	0	0	3.4	-0.2	1.8
JBOA	00	V	500	1	0	0	2.9	0.9	-1.2
JCCX	00	V	500	1	0	0	2.0	1.1	0.0
JGQH	00	V	500	1	0	0	2.0	-0.6	-1.8
JIVB	00	V	500	1	0	0	2.0	0.2	0.3
JPNOM	00	V	500	1	0	0	2.0	-0.6	-0.4
LDWR	00	V	500	30	0	0	2.6	-0.1	0.1
LDWR	12	V	500	29	0	0	2.2	0.1	0.2
OVYA2	00	V	500	15	0	0	2.5	0.7	-0.5
OVYA2	12	V	500	13	0	0	3.7	-0.2	-0.4
OXYH2	00	V	500	18	0	0	2.9	0.8	0.6
OXYH2	12	V	500	18	0	0	5.1	-1.8	0.7
SHIPS	00	V	500	3	0	0	5.1	-2.2	-2.2
TRAC98	00	V	500	1	0	0	5.1	-6.7	-7.5
TRAC98	12	V	500	2	0	0	5.1	0.1	4.6
UBNR	00	V	500	1	0	0	5.1	1.1	-1.3
V2GH	00	V	500	1	0	0	5.1	0.2	0.6
V2VM	00	V	500	10	0	0	5.1	-1.2	-0.2
V2VM	12	V	500	14	0	0	2.5	1.1	-0.8
V2VM/8100		V	500	1	0	0	2.8	-0.9	-1.1
V2XM	00	V	500	4	0	0	2.8	0.0	0.7
V2XM	12	V	500	2	0	0	2.8	1.4	0.1
03953	00	V	500	30	0	0	2.4	1.1	0.2
03953	12	V	500	30	0	0	3.6	0.1	0.1
04018	00	V	500	14	0	0	2.8	1.4	-0.1
04018	12	V	500	13	0	7	2.9	-0.9	0.5
04220	00	V	500	28	0	3	5.1	-0.5	0.3
04220	12	V	500	27	0	0	3.2	-0.7	-0.5
04270	00	V	500	28	0	0	2.9	1.1	0.9
04270	12	V	500	27	0	0	3.5	0.1	0.4
04339	00	V	500	30	0	0	3.1	-0.2	-1.3
04339	12	V	500	30	0	0	4.0	-0.8	-0.9
04360	00	V	500	27	0	0	4.0	-0.7	1.1
04360	12	V	500	28	0	0	2.3	-1.0	1.6
08001	00	V	500	28	0	0	3.1	-0.5	-0.8
08001	12	V	500	26	0	0	2.6	0.0	0.1
08508	00	V	500	1	0	0	3.2	0.7	-4.9
08508	12	V	500	22	0	0	3.2	-1.2	0.0
60020	00	V	500	21	0	0	2.3	1.2	0.5
60020	12	V	500	20	0	5	3.4	0.5	0.0
71600	00	V	500	29	0	3	2.3	0.7	-0.3
71600	12	V	500	28	0	0	4.6	1.5	-0.1
72201	00	V	500	25	0	0	3.2	1.0	0.3
72201	12	V	500	28	0	0	2.6	0.9	-0.1
72402	00	V	500	28	0	0	2.3	1.2	-0.6
72402	12	V	500	29	0	0	2.7	0.0	1.1
74494	00	V	500	28	0	0	2.6	-1.2	0.0
74494	12	V	500	30	0	0	2.1	-0.5	1.0
78016	00	V	500	27	0	0	4.4	-0.9	0.1
78016	12	V	500	26	0	0	1.9	-0.1	-0.2

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed m s^{-1}
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45